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THE
PENNY
MAGAZINE
OF THE
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New Series.

1842.

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PORT LINCOLN, SOUTH AUSTRALIA.

The town of Port Lincoln is an offshoot of one of the youngest of our colonies. The act for constituting the portion of New Holland now called South Australia into a British province was passed in August, 1834. The first vessel which sailed for the new province, then without a single colonist, was despatched from London in February, 1836, and before the 1st of May was succeeded by two or three others, which conveyed the surveying staff for examining the coast and selecting a site for the principal settlement; besides other persons whose duty it was to make preparations for the more convenient reception of emigrants. The site of the first town was chosen on the eastern side of the Gulf of St. Vincent; and here the city of Adelaide, the capital of South Australia, has arisen with a rapidity hitherto unknown in the history of British colonization. In less than five years the rental of the houses in Adelaide amounted to 20,000L a year; it is not, however, our intention to give an account here of this place, but of a town which has sprung up still more recently.

Our cut represents Boston Bay, taken from the back of Port Lincoln, on the western shore of Spencer's Gulf, an inlet of much greater extent than the Gulf of St. Vincent. A glance at the cut will enable the reader to understand the situation of Boston Bay. It comprises an area of about fifty square miles at the head of Spencer's Gulf, the coast here forming the base of an equilateral triangle about two hundred miles in extent, and the town of Port Lincoln being situated near the apex of the peninsula. Boston Island stretches across the bay, having an opening on the north-east, formed by the northern end of the island and a part of the mainland called Boston Point. The southern entrance is formed by two islands called the Brothers (separating Spalding Cove from Stamford Hill), and the southern part of Boston Island. From the head of the bay to Stamford Hill is fifteen miles, while from the centre of Boston Island to the town of Port Lincoln (situated on the extreme right of the cut) the distance is from four to five miles. There are no dangerous reefs nor sunken rocks, and the bay is completely land-locked. By keeping about three-quarters of a mile from the northern point of Boston Island, there are always from seven to thirteen fathoms water. This bay has been compared to the magnificent harbours of Rio Janeiro and Toulon.

The advantageous situation of Port Lincoln was overlooked when the surveying expedition was in search of a site for the capital, but it was not destined to be long neglected. Early in 1839, a gentleman whose judgment in the selection of land was highly appreciated by many of the settlers at Adelaide, left that place for Boston Bay to examine the district with a view of obtaining a special survey for four thousand acres; but he was cunningly outwitted, during his absence, by some persons who had sufficient confidence in the soundness of his views to be fully aware that they might safely be guided by
inhabited houses, besides others that were not completed. Generally speaking, the settler in a new country is glad at first to obtain the shelter of a log-house. The district is watered by two rivers, the Tod and the Hindmarsh. Besides the above advantages there were discovered beds of excellent oolite or freestone, not inferior to that found at Bath, and which is expected to become an article of export to other parts of Australia; lime was very easily obtained; and the red gum-tree, which is well adapted for building purposes, grew in abundance in the vicinity. With the exception of iron, materials of the best quality for building were all found on the spot, and the houses at Port Lincoln are the most substantial in South Australia.

In May, 1840, upwards of thirty houses had been erected; and in March, 1841, there were nearly sixty inhabited houses, besides others that were not completed. Generally speaking, the settler in a new country is glad at first to obtain the shelter of a log-house. The population of Port Lincoln, in May, 1840, was about 270; but it has no doubt since increased in an almost proportion with the increase of houses, and probably at the present time may contain five hundred inhabitants. A church has been built, an infant-school established, and a newspaper is published weekly. Agricultural and pastoral pursuits are carried on in the "bush," that is, in the unsettled parts of the district, where there is a tract of fertile soil of considerable extent, quite sufficient to support a large town at Port Lincoln; and there are besides some excellent sheep-walks and rich and beautiful tracts adapted for pastoral pursuits. Besides these resources, the town of Port Lincoln will derive the means of prosperity and wealth from the whale fishery, as it is well adapted for carrying on this enterprising enterprise; and there are good nautical reasons for its claims as the best shipping-port for oil to Europe for the whole of the western coast of South Australia, which abound in stations favourable for carrying on the fishery. Boston Bay was well known to the French and American, as well as to the English whalers, before it was settled. They resorted to the bay for wood and water; and since the town has sprang up, they are now supplied with fresh provisions, instead of being compelled to proceed to more distant parts. In October, 1840, when our sketch was taken, there were in the bay, or had visited it during the month, Le Nil, 450 tons; La Reunion, 400 tons; L'Aigle, 350 tons; L'Indien, 400 tons; the Hudson, 500 tons; the Recovery, 600 tons; the Lord Sidmouth, and other whalers and merchant vessels. The Recovery took in wood and water in two days, and Le Nil conveyed on board three hundred barrels of water in thirty hours. Whales are caught in the bay; and the botany of the district exhibits the pursuit of one of these animals by the boats of Le Nil; also the boats of La Reunion conveying water on board. The anchorage of the vessels, in 54 fathoms, is correctly given. A Company has been formed at Port Lincoln for the prosecution of the whale fishery; and

with the adourn that distinguishes the hopefulness of colonists, the inhabitants of Port Lincoln are looking forward to the period when their town will be the Liverpool of South Australia; and why should not this hope be realised? Here are elements of prosperity which need only the combined energy of intelligent men to render them of social value. The climate is propitious to the vine, the orange, dates, peaches, and melons, and to the less luxurious but perhaps more valuable crops of more temperate climates. Doubts may be reasonably entertained of the salubrity of some of portions of South Australia; but at a dinner, given in May, 1840, at Port Lincoln, to Colonel Gawler, the governor of South Australia, he said:—"I never saw a spot or heard of a climate more calculated to restore debilitated constitutions." In less than a century there will probably be found all round the shores of New Holland flourishing communities of intelligent and enterprising men speaking the English tongue. Possessing, in an extraordinary degree, the power of producing commodities which there is always a great demand for, such communities create a corresponding demand for all articles of import of which they stand in need. In 1840, the imports of wool from the Australian colonies amounted to nearly ten million pounds, which is only about one-fifth of the quantity we require beyond that which is supplied by our own flocks. The exports of the whole of the southern produce of Australia exceeded 2,000,000L in the same year. In proportion to its population the colony of New South Wales has a commerce four times greater than the Canadas; and the industry and resources of Van Diemen's Land give rise to an external demand six times greater than the Canadas.

MENTAL DIVISION OF LABOUR.—THE FRENCH NUMERICAL TABLES.

There is a celebrated set of mathematical tables now existing in manuscript in France, the history of which is remarkable, as illustrating the doctrine of the division of labour, of which the advantages are so well known in our own day.

The doctrine here alluded to was first clearly stated by Adam Smith, in his Wealth of Nations. It relates to the desirability of subdividing any great work, any great effort of mental or bodily labour, into portions requiring different kinds and degrees of ability, in order that no one of the persons employed may be required to expend his time and attention on matters beneath his powers. Smith states that "the greatest improvement in the productive powers of labour, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed or applied, seem to have been the effects of the division of labour;" and he considers the nature of this improvement to be shown in three different ways: first, by reducing every man's business to some one kind of operation, the division of labour necessarily increases very much the dexterity of the workman, and therefore increases the quantity of work which he can perform in a given time; secondly, the advantage which is gained by saving the time commonly lost in passing from one sort of employment to another, is effected by a judicious division of employments; thirdly, the invention of all the numerous machines whereby labour is so much facilitated and abridged, seems to have been originally owing to the division of labour.

It forms no part of our object here to follow out these principles to their application in manufactures (for which they were especially intended), as illustrated in pin-making and other branches of mechanical art, but to detail one notable example of their application in mental processes.
Most persons are probably aware that for various purposes of science and art extensive mathematical tables are requisite, such as tables of the squares and cubes—the square roots and cube roots—of numbers; the logarithms of numbers; the sines, tangents, and other trigonometrical measurements of angles; and numerous others. Such tables have been computed from time to time, principally at the expense of the various governments of Europe, but sometimes at the cost of private individuals. The names of Vega, Callet, Hutton, Gardner, Taylor, Vlacq, Briggs, Barlow, Babbage, &c. are familiar to mathematicians as the authors of such tables.

During the fevered state of excitement which followed the commencement of the French Revolution, vast changes were made not only in the constitution and government of the country, but also in matters relating to science. Among the most celebrated of these was the preparation of a decimal system of weights, measures, and calculations in general; and the French government was desirous of producing a series of mathematical tables which should be in exact harmony with this system and the extension of this system. The most distinguished mathematicians and philosophers were invited to construct such tables on the most extensive scale; and in the year 1792. M. Prony, a man of science, who died only two or three years ago, was placed at the head of the commission to whom this office was entrusted.

The mode in which the ‘division of labour’ came to be specially employed in this undertaking is exceedingly curious. The professed object was to produce a set of logarithmic and trigonometrical tables, which should not only be adapted to the decimal system of weights and measures, but should also ‘form a monument of the most exacting of exact sciences as to which had ever been executed, or even conceived.’ The logarithms of numbers from 1 to 200,000 formed a necessary portion of this labour; and Prony saw very well that even if he were associated with three or four able men, the greatest presumable length of life would not suffice for him to see the conclusion of the great work. While occupied with anxious thoughts as to the mode in which he might effect his purpose, he chanced to see in a bookseller’s shop at Paris a copy of Smith’s Wealth of Nations, published about sixteen years before. He opened the book at the part where Smith illustrates the advantages of division of labour by reference to the pin-manufacture; and instantly conceived the idea of applying the same principle to calculations. He was about that time lecturing at l’Ecole Polytechnique, on a part of mathematics to which such a division might be easily applied, and his mind was thus prepared for the reception of the hint. He then passed some days in the country, where he formed, in conjunction with Legendre, a plan of operations. To use his own language: ‘I gave myself to the task of effecting, and the more so as I was capable, and occupied myself at first with the general plan of operation. All the conditions which I had to fulfil rendered necessary the employment of a great number of calculators; and it occurred to me to apply to the preparation of these tables the division of labour, from which the manufacturing arts derive such immense advantages by uniting the perfection of manufacture the economy of time and expense.’

The plan adopted by Prony was to collect three different sets of assistants, possessing three different kinds of talent, the most numerous body being composed of persons having a very limited range of ability. The first section or body was composed of five or six of the most numerate writers, by uniting the perfection of manufacture and the economy of time and expense.”

The second section consisted of seven or eight persons having considerable acquaintance with mathematics, but not necessarily so profound as the members of the first section. Their duty was to bring the labours of the first section to a greater degree of simplicity, so as to be clearly understood by the humbler arithmeticians of the lower or third section. The forms of proceeding, or patterns, as prepared by the second section from the labours of the first, were by them delivered to the members of the third section. The latter gave the finished calculations to the second section, the members of which had certain means of verifying the calculations without the necessity of repeating certain operations which were thus explained.

The third section consisted of nearly a hundred individuals, who were divided into two parts, meeting in two workshops (if we may use the term), and occupied by separate persons. This section had little or no connection with the second, and was essentially mechanical, requiring the least knowledge and by far the greatest labour, the first class perhaps being likened to master-builders, who put the architects’ plans into a form fit to be understood and worked out by the workmen.

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THE PENNY MAGAZINE.

JANUARY 1,

tables are still confined, in manuscript, to the library of the Paris Observatory. A writer in the 'Edinburgh Review' for 1834, while speaking of these tables, says:—"The printing of them was commenced by Didot, and a small portion was actually stereotyped, but never published. Subsequently the plates were abandoned, and the undertaking, the sudden fall of the assignats rendered it impossible for Didot to fulfil his contract with the government. The work was accordingly abandoned, and has never since been resumed. We have before us a copy of one hundred pages folio of the portion which was printed at the time the work was stopped, given to a friend on a late occasion by Didot himself."

The great work here alluded to illustrates in an instructive manner the doctrine which Adam Smith promulgated. Not only were the time and talents of the distinguished mathematicians spared from a drudgery of calculation altogether beneath them, but the calculations were actually made with more correctness and rapidity by persons of humbler talent. A statement appeared in the 'Quarterly Review' a short time back, illustrating a somewhat similar instance of division of mental labours. In the great Trigonometrical Survey of Ireland, which has been carried on for several years, and is still in progress, the country is parcelled out into a number of very large triangles, which are subsequently divided into smaller ones. The measurement of the larger triangles requires all the resources of refined science; but the smaller ones, after being obtained by instrumental observation, are worked out by simple addition and subtraction. The officers of the survey have found numbers of peasant boys in Ireland who have made these calculations at a halfpenny a triangle.

HOLLAND HOUSE, KENSINGTON.

This picturesque-looking mansion, the name of which has been so familiar to us, in connection with the memories of Addison and Fox, and of its late lamented possessor, derives that name from a remarkable man, who may almost be looked upon as its founder. Henry Rich, earl of Holland, the favourite of Henrietta Maria, and the alternate supporter and opponent of her royal husband during the civil war, became the owner of this house, Abbotts Kensington, which had been built by his father-in-law, Sir Walter Cope, on the death of the latter, and then not only altered its name to Holland House, but added to the place most of the peculiar magnificence which subsequently characterized it. The two detached stone piers that we see, one at each extremity of the court before the house, as we stand on the foot-path that divides the latter from the lawn in front, are evidence of the taste both of the artists, Inigo Jones and Mr. Stone, and of their noble employer, in making the improvements and additions referred to. But the earl's turbulent discontented disposition and his utter want of a steady principle left him little leisure for enjoying the comforts and splendour of such a home, and on more than one occasion the leisure that he did obtain he would willingly have dispensed with:—twice he was made prisoner here. We have not space, nor is it worth while, to follow the career of such a man; but it may be noticed, as a curious evidence of his fickleness, untrustworthy character, as well as of the confidence of the address and eloquence of his speech, that whilst at one period he is found sitting at Charles's council-board, at another he comes from the parliament to Newcastle as the bearer of their famous declaration, which he reads to the king, not without interruptions of a disagreeable nature; later still he again takes arms in the royal cause, but is suddenly overpowered, sent to the Tower, and is executed not long after Charles himself, with but little sympathy from any quarter. During one of the periods of his adhesion to the parliamentary cause, Holland House became the scene of an important meeting. When the Presbyterian party, in 1647, with Hollis and others at their head, were mainly endeavouring to stop the progress of the army towards London, a body of the Independents, including no less than fifteen lords and above a hundred commoners, advanced to meet their general Fairfax, and Holland House became the scene of the important conference that ensued. It was there that they signed the declaration issued by the army; and it was from thence that they all returned in solemn and imposing procession with Fairfax to London, and resumed their places in parliament. Soon after this, we find Fairfax residing here, and during this period, no doubt, took place the famous interview on the lawn, between Ireton and Cromwell, on matters of the highest importance, most probably in connection with that remarkable paper called the 'Proposals' of the officers, wherein "they provided for the general reform and re-settlement of the kingdom upon principles of the largest liberty, both civil and religious, and of a glorious toleration, which Europe had not yet even seen in history."* Ireton is understood to have been the author, but to have had the assistance of his great father-in-law.

The parliament seems to have dealt gently with the earl's widow, for no very long period elapsed before Holland House was restored to her, when it became famous for a new kind of attraction. During the civil war, the actors generally took up their barrack in the garden, and in the hall of some nobleman's or gentleman's mansion; among these Holland House became conspicuous.

It was in 1716 that Addison gave a new interest to Holland House by becoming a resident, on his marriage with the Dowager Countess of Warwick and Holland. The interest unfortunately is more of a painful than pleasant nature. Some one observed at the period, "Holland House is a large mansion, but it cannot contain Mr. Addison, the Countess of Warwick, and one guest, Peace!" The tradition of Addison's visits, in company with his friends Steele, Phillips, Davenant, &c., to a neighbouring tavern, is but a natural consequence: the place is supposed to be the inn known as the White Horse. It was said that Addison's acquaintance with the countess arose from his having been appointed tutor to her son, the earl of Warwick, but that has been denied. Addison at all events took so great an interest in the young man's welfare as to remember him in his dying moments. Few can have forgotten that scene. It was in a large but somewhat gloomy room at the Elgin terminus of the division of the house that the youthful earl, who is said to have led a very irregular life, found the great moralist, who had summoned him thither. After a pause, the youth said, "Dear sir, you sent for me, I believe,

* 'Pictorial England,' vol. iii., p. 370.

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THE PENNY MAGAZINE.

and I hope you have some commands; I shall hold them most sacred. Addison grasped his hand, and said in a low tone, "See in what peace a Christian can die." Besides the portrait in the mansion, a lane bounding it to the east, called Addison Road, calls to our memories this illustrious inmate of Holland House.

It was about 1762 that the place first entered into the possession of the Fox family, which has bequeathed to it its latest and not least interesting memories; when the Right Hon. Henry Fox, afterwards created Lord Holland, became first a tenant, and subsequently its owner. Much of the early life of his grandson, Charles James, was spent here, and in his decline many a fond remembrance of the place lingered about the great statesman's heart. On his last visit to the beautiful and extensive gardens which extend at the back of the mansion, "he looked around him," says his biographer, Mr. Trotter, "with a farewell tenderness that struck me much. Every lawn, garden, tree, and walk, were viewed by him with peculiar affection. He pointed out its beauties to me, and, in particular, showed me a green lane or avenue which his mother, the late Lady Holland, had made by shutting up a road." The original mould of Westmacott's statue of Fox in Bloomsbury Square stands in the entrance-hall of Holland House; a fitting memorial, and in a most appropriate place, of him whose features it preserves to posterity.

Passing over with hurried notice the chief features of the house, such as the elegant gilt room, considered one of the most interesting specimens of domestic architectural decoration we possess of the period of James I. or his son; the busts and pictures, the latter including works by a long list of illustrious artists; the library, above a hundred feet long; and the pleasure-grounds, with its poetical and other memorials, including that by Lord Holland commemorating a visit of the author of the 'Pleasures of Memory'—

'Here Rogers sat, and here for ever dwell
To me those pleasures which he sang so well'—

we transcribe by way of conclusion a passage from a recent number of the 'Edinburgh Review,' having especial reference to the latter recollections of Holland House, written evidently by one who has been a sharer

of its magnificent hospitality, and of the society of its distinguished owner, and of the brilliant circle he loved to draw around him.

"In what language shall we speak of that house once celebrated for its rare attract ons to the farthest ends of the civilized world, and now silent and desolate as the grave? That house was a hundred years ago apostrophised by a poet in tender and graceful lines, which have now acquired a new meaning not less sad than that which they originally bore:

' Thou hill, where the antique structures grace,
Rear'd by bold chiefs of Warwick's noble race;
Why, once so loved, when'er thy bowers appear,
O'er my dim eyeballs glance the sudden tears?
How sweet were once thy prospects fresh and fair,
Thy sloping walks and unpolluted air!
How sweet the glooms beneath thine aged trees,
Thy noontide shadow, and thine evening breeze!
Thy walks and airy prospects charm no more;
No more the summer in thy glooms allay'd,
Thy sloping walks, and thy noon-day shade.'

Yet a few years, and the shades and structures may follow their illustrious masters. The wonderful city, which, ancient and gigantic as it is, still continues to grow as fast as a young town of logwood by a water privilege in Michigan, may soon displace those turrets and gardens which are associated with so much that is interesting and noble, with the courtly magnificence of Rich, with the loves of Ormond, with the councils of Cromwell, with the death of Addison. The time is coming when, perhaps, a few old men, the last survivors of our generation, will in vain seek, amidst new streets and squares, and railway-stations, for the site of that dwelling which was in their youth the favourite resort of wits and beauties—of scholars and philosophers, and statesmen. They will then remember with strange tenderness many objects once familiar to them; the avenue and the terrace, the busts
and the paintings; the carving, the grotesque gilding, and the emblazonments. With peculiar fondness they will recall that venerable chamber in which all the antique gravity of a college library was so singularly blended with all that female grace and wit could devise to embellish a drawing-room. They will recollect, not unmoved, those shelves loaded with the varied learning of many lands and many ages; those portraits in which were preserved the features of the best and wisest Englishmen of two generations. They will recollect how many men who have guided the politics of Europe—who have moved great assemblies by reason and eloquence—who have put life into the commercial life of a town; who have left to posterity things of the censure of fortune; who have moved the greatest assemblies by the force of their conversation, so natural, so animated, so various, so rich with observation and anecdote; that of shirts.

The linen manufacture in Switzerland can be traced back to a period which, considering all the circumstances of the case, may be deemed rather remote. As early as 1260 a fulling-mill and a bleaching establishment existed in the town of St. Gall; and by 1308 their number was trebled. About the year 1450, a certain number of commercial officers were appointed at the same town, who were bound upon oath to inspect and examine every piece of linen which came to market, and to affix thereon a mark expressive of its quality and current value. By about the year 1500 there appeared to have been two classes of manufacturers in St. Gall and Appenzell; one of which consisted of master weavers settled at St. Gall, and members of a guild of that town, who employed spinners and weavers of the canton of Appenzell; the other consisted of master weavers in Appenzell, who had no connection with the guild at St. Gall, but sold their linen cloths to the merchants of that town.

Soon after the discovery of America had opened a new market for woven fabrics, a commercial company at Appenzell established dyeing and bleaching establishments, and the cotton manufacture became added to that of linen. A feeling of jealousy between the manufacturers of the contiguous cantons of St. Gall and Appenzell led the merchants of the latter to find a market for their goods without the aid of the former as heretofore; and officers, called Exprters, were sworn in to measure and mark the quality and value of the pieces of cloth exhibited for sale. For some years the average sale was more than three hundred thousand pieces annually. During the early half of the eighteenth century the manufacture of cotton and linen became a regular branch of industry, which, both from its importance to the canton and the peculiar mode in which it is carried on, presents many very interesting features. We will collect and present, in an abridged form, such portions of Dr. Bowring's Report on the Manufactures of Switzerland as relate to this subject.

THE LINEN AND COTTON MANUFACTURES OF APPENZELL.

In the canton of Appenzell, Switzerland, south-westward of the lake of Constance, the production of woven fabrics of cotton and linen constitutes a branch of industry, which, both from its importance to the canton and the peculiar mode in which it is carried on, presents many very interesting features. We will collect and present, in an abridged form, such portions of Dr. Bowring's Report on the Manufactures of Switzerland as relate to this subject.

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order of things, but an accession to the wealth of the community as a whole.

It is supposed that the quantity of cotton-yarn imported from England into Appenzell has amounted to about a million of pounds weight annually for the last twenty years; but there seems reason to believe that this quantity will decrease rather than increase, for spinning-machines of modern construction are rapidly finding their way into Switzerland. Hitherto, however, the factory system is not much acted on in that country, principally because the inhabitants, from their fondness for individual liberty, would submit with difficulty to the restrictions which they would be compelled to observe in an establishment conducted entirely by machinery.

The working classes engaged in these branches of productive industry are divisible into four different sections, viz. the manufacturers, the weavers, the winders, and the embroiderers; and their employments, mode of life, and social position may be glanced at in succession. 

Merchants or manufacturers, who buy spuncotton, have in early life belonged to the class of weavers, can at in succession.

Manufacturers.—This term is applied to those who would perhaps be termed masters in England, and who undertake the entire completion of a piece of cloth. The humblest of them manufactures only as much as himself and his family can weave; but the most influential employ as many as a hundred weavers or embroiderers. These manufacturers sell their goods either unbleached to the traders at home, or bleached to foreigners. This class of persons take a great interest in public affairs, and pride themselves particularly on their probity and honour. It is this class which furnishes the greatest number of magistrates and parochial authorities of the canton; the magistrates are not paid, but serve their country from a sentiment of duty and patriotism. They are generally economical, skilful, and industrious, acquire handsome fortunes. In their domestic relations the following is the routine of daily diet, from which their position may in some degree be compared with analogous classes in other countries. They breakfast upon coffee and milk, butter, honey, or green cheese called Schabziger. Their dinner is composed of soup and bouillon of some floury or mealy ingredient, potatoes, or porridge. Their beverage is cider or milk. Many of them sup upon coffee, as at breakfast; and they seldom drink wine, except when they go to the inn on Sunday evenings, or by accident on some other day of the week. There are some parishes where it is the custom to go to the inn every day after the cattle, in carrying their work to the manufactories, in warping their yarns ready for the loom, and in the performance of certain militia duties which devolve upon them as members of a free state. The earnings are from two to nine shillings per week; but the greatest number do not exceed from four to five shillings. It is true they are not altogether excused from all the duties of a freestate. The oldmen, the women, and the children wind off the thread for the individuals of the family who are employed in weaving.

The better class of weavers, those first alluded to, live principally on coffee, milk, oatmeal, and potatoes, a few indulging themselves with meat and cider on Sundays. They work about fourteen hours a day; but this work is not wholly weaving; for portions of the day are taken up in cultivating their farms, in looking after their cattle, in carrying their work to the manufactories, in warping their yarns ready for the loom, and in the performance of certain militia duties which devolve upon them as members of a free state. The earnings are from two to nine shillings per week; but the greatest number do not exceed from four to five shillings. It is true they are not altogether excused from all the duties of a freestate. The oldmen, the women, and the children wind off the thread for the individuals of the family who are employed in weaving.

Weavers.—The weavers are generally employed by merchants or by manufacturers, who buy spun cotton, and give it to the weaver. The latter makes it into cloth, and returns it to the owner, receiving so much per yard, per piece, or per handkerchief, as the price of his labour. The weaver, as soon as it is possible for him so to do, purchases a small house, or even a small estate, the manufacturer frequently furnishing the means of making the purchase. He then becomes a farmer as well as a weaver, employing his leisure time in cultivating his ground and raising food for himself and family. This very remarkable system, which for many reasons could not be acted on in such a country as England, has some disadvantages as well as advantages. The acquisition of landed property is greatly restricted by the system by which the land is held. It exists: it is very easy to borrow money upon mortgage, and by that means to purchase for two or three hundred florins property amounting to ten times the value. This arrangement has the disadvantage of rendering landed property exceedingly dear; and, consequently, should the manufacture not continually prosper, or if the produce of the soil is not valuable, the purchasers are not able to pay the interest of the money which they have borrowed, and failures become frequent. On the other hand, this acquisition of landed property by the weaver has the effect of spreading the population over the whole surface of the country, bringing all the soil into an excellent state of cultivation, and preserving the health of the weaver.

This class of weaver landowners form the great mass of voters in the popular assemblies; and as they live in a very retired manner, never frequenting the inns but on the days which are appointed for popular amusement, or by evident on a market-day, it is scarcely possible to predict beforehand in what manner their electoral suffrages will be given.

But there is another class of weavers, who, not having the means to acquire property, maintain a lower rank in the social scale. They are merely tenants, and often change their place of abode. They are in general neither so industrious nor so clever as the class just alluded to; and their conduct is often irregular. As the earnings are smaller, and the advantages of economy less appreciated among them, they are much poorer than the others. They live very cheaply when obliged to do so, taking only a little coffee or milk three times a day, with potatoes, the cost of which does not altogether exceed the amount of three kreutzers (about one penny) per diem. They generally make an arrangement with the chief tenant or farmer to be permitted to cook at his fire, and to warm themselves in the same apartment with the family: they also assist the farmer in his out-door employments. The old men, the women, and the children, wind off the thread for the individuals of the family who are employed in weaving.

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Winders.—When old people of both sexes, who have in early life belonged to the class of weavers, can no longer carry on that occupation, they become winders; and if they have not enough employment in winding off thread for their friends or relations, they wind off the chain for the manufacturers, and earn from three to nine kreutzers (i.e. from one to three pence) per day.

Embroiderers.—This class of workpeople consists principally of women and young lads. The merchants who deal in embroidered goods purchase plain muslins and choose or sketch ornamental patterns. These patterns are then engraved by the best artists, and printed or stamped upon the muslin. The stamped muslins being handed over to the embroiderers, each person takes a certain part, so that a piece of embroidery, where there are three or four different figures or patterns, passes through the hands of as many workmen. The embroiderers earn, on an average, about eighteen kreutzers (six or seven pence) per day.
This very small canton, whose superficial area is not much above four geographical square miles, is supposed to contain ten thousand looms, the produce of which forms almost the entire wealth of the canton, pays for all the imposts, and keeps the canton out of debt.

THE KAHAU.

The Kahau (Semnopithecus Larvatus) is, in many respects, the most singular and anomalous species, not only of the present genus, but even of the entire family of Simiae. This extraordinary creature, of which the annexed engraving, taken from a fine specimen procured by the late Sir Stamford Raffles, and by him deposited in the museum of the Zoological Society, presents a very accurate likeness, is an inhabitant of the great island of Borneo, and, according to M. Geoffroy St. Hilaire, of Cochin China, and even of the western peninsula of India. It is probably the largest species of the genus, the body of the full-grown male attaining nearly the size of an ordinary man, and evidently possessing a very large head. The females are considerably smaller, as is generally if not universally the case among the Quadrumanæ; they likewise differ from the males in other respects, which will be noticed hereafter, and which at first sight appear so distinctive as to have led Mears, Vigors and Hornfield to describe the sexes as different species.

The entire height of this animal, when standing upright, exceeds three feet six inches; the length of the body is two feet six inches, and of the tail two feet three inches. The body is large and robust; the head round and rather flattened, with a low forehead; the eyes are large and well separated from one another, and are unaccompanied either with brows or inferior eyelashes; in all probability the very large palpable tear gland gives rise to the long powerful canines and strong broad incisore teeth; the ears, though naked, like the face, palms of the hands, and soles of the feet, and of the same dark blue colour, are concealed by the long hair of the head; and the neck is extremely short and thick, and apparently deformed by a goitre-like protuberance, in all probability produced by the larynx, as which Wurmb informs us exist in this species as well as in the orangs, and which are reproduced in the siamang and others of the true apes. But the most extraordinary and anomalous trait in the physiognomy of the kahau is the enormous and disproportioned size of the nose, which has a most ludicrous appearance when viewed in relation to the diminutive size of the animal, and almost impresses the spectator with the idea that nature intended it as an extravagant caricature upon that organ in the human subject. The nose of the kahau in fact is not flattened, and as it were rudimentary, as in the other Simiae, but even more prominent than in man, and prolonged beyond the mouth in such a manner as to form a kind of small proboscis, a resemblance which has even procured it the name of the proboscis-monkey from some naturalists.

The body of the kahau is covered with hair of a reddish brown or dull chestnut colour, deepest on the back and flanks, light orange upon the chest, and greyish-fawn on the belly, thighs, leg and arms, as well on the outer as on the inner surfaces. These colours are less apparent and not so strongly contrasted in the females as in the males, and the latter sex is likewise marked on the loins by a number of large rectangular spots, producing a bizarre variegation, of which it is difficult to convey a clear idea in words, but which is very striking in the animal. The females are destitute of these diversified marks, the loins and back being of a uniform reddish-brown colour; the nose also is much smaller in proportion and less prominent than in the other sex, and has a recurved or puggish form, scarcely surpassing the mouth in length, whereas it has rather a drooping aspect in the males, and is very considerably prolonged beyond the upper lip.

This very remarkable animal has been described by Wurmb, in the 'Memoirs of the Society of Batavia,' from specimens which he had himself shot in the island of Borneo; and as his account is the only one on record, derived from original observations, or which professes to relate the habits of the kahau in his native forests, we shall give the most interesting part of it in his own words:—

"These animals," says he, "associate together in numerous companies: their cry, which is extremely loud and grave, distinctly pronounces the word kahau, and it is doubtful from this circumstance that some Europeans, by changing a into o, have supposed the name of the animal to be kabau. The natives of Pontiana in Borneo, however, in the woods surrounding which town they are sufficiently numerous, give them the name of bantajau, on account of the peculiar form of their nose. They assemble together morning and evening, at the rising and setting of the sun, and always on the banks of some stream or river: there they may be seen seated on the branches of some great tree, or leaping with astonishing force and rapidity from one tree or branch to another at the distance of fifteen or twenty feet. It is a curious and interesting sight; but I have never remarked, as the accounts of the natives would have you believe, that they hold their long nose in the act of jumping; on the contrary, I have uniformly observed that on such occasions they extend the legs and arms to as great a distance as possible, apparently for the purpose of presenting as large a surface as they can to the atmosphere. The nature of their food is unknown, which renders it impossible to keep them alive in a state of confinement. They are of different sizes; some are even seen which do not exceed a foot in height, though they have already become mothers, and are engaged in nursing their young. When seen from above, the nose of this animal has some resemblance to a man's tongue, with a longitudinal ray running down the centre. The nostrils are oblong, and the creature has the power of distending them with air to the extent of a full inch or upwards. The brain is in all respects similar to that of the human subject; the lungs are as white as snow; the heart is surrounded by a great quantity of fat, and this is the only situation in the body in which substance is found. The stomach is of an extraordinary size and of an irregular form, and there is a sac beneath the skin of the neck, which extends from the lower jaw to the clavicles.
It is not often that we are so fortunate as to obtain the facts of genuine history with the interest that belongs to romance,—that we are able, centuries after the period in which the chief actors lived and died, to revive them at will in the pages of the narrator of their deeds,—to become familiar with their aspect, their manners, their actual individual selves, to see and hear, in short, rather than read of them; yet what lover of Froissart but remembers how pre-eminently these are his characteristics? Who ever sat down to a perusal of the 'Chronicle' without feeling the consummate mastery of its author absorb him in all the picturesque details of the chivalry of the middle ages? Certainly, Froissart is no historian in the present acceptance of the word, which implies a searching and philosophical inquiry into the causes of events; no writers of his period were; neither is he a moralist testing all things by the simplest and most unchanging rules of right and wrong, and praising or condemning accordingly; had he been so, he would never have been able to obtain the materials for his labours, nor we to enjoy the fruit thereof; but in what he endeavoured to be, and in what he is,—the most faithful and attractive of *historical painters*,—he stands confessedly without a rival. The brilliancy of the knighthood, the cruelty of the warfare, the superstitious credulity of the religion, and the poetical sentimentality of the love, of the fourteenth century, are described by him in such vivid, yet withal such exquisitely simple language, that it may be reasonably doubted whether any other period of equal importance has ever been made so well known, or so interestingly, in all its essential features.
by a single man. Such is a brief view of the author to whom we propose to devote a series of papers commencing with a short notice of the principal events of his

And never were life and writings more in harmony with each other—and in that fact we have the grand secret of Froissart's success. Although led by circumstances into the priesthood, and deriving from thence encomiums which he could not afford to give up; from his earliest years to his latest we find him ever surrounded by the symbols of the realizations by which he forms the subject of his great work. He was born at Valenciennes about 1337, and his father was a herald-painter; in whose workshop—or, to dignify the place with a name more consonant to the repute of the profession, studio—we may imagine the boy often standing by his parent's side, watching the progress of the emblazoning of some splendid garb or device, and devouring with eager ears a romantic or spirit-stirring tale of the good knight its future owner, and the great events with which he had been connected. Froissart expressly says that in the knowledge of such things he had "always taken greater pleasure than in anything else."

Of his personal tastes in the early part of his life he has left us an amusing account. From the age of twelve, "Well I loved," he says, "to see dances and expens to Scotland and different parts of Europe. In carollings, well to hear minstrelsy and tales of glee, his travel through Scotland he rode on a palfrey, and fair beds for refreshment; and for my better recreation, a night draught of Claretor Rochelle wine, mingled with spice." It is curious enough that Froissart's career was one above all others singularly calculated to afford him the means of gratifying such desires, and that without any danger of making a mere sensualist of him. From the time that he began to write at the instance of his dear lord and master, Sir Robert de Namur, knight, lord of Beaufort, whilst yet scarcely twenty years of age, he spent nearly the whole of his life in wandering about Europe—France, Germany, and the present of a good cote-hardie' (as species of tunic), with a purse of twenty florins in one of the pockets, that was made to him by the host, in accordance with the customs of the times. At Ferrara he received a similar present from the king of Cyprus.

About this time Froissart suffered the severest loss to appear at any time known—his good and kind mistress, Queen Philippa, who died in 1360. Froissart's account of the event seems to us exquisitely touching and beautiful, and may serve as a not unfair example of his style and powers. "In the mean season there fell in England a heavy case and common; howbeit it was right piteous for the king, his children, and all his realm; for the good queen of England, that so many good deeds had done in her time, and so many knights succoured and damsel comfortably, and had so largely departed of her goods to the people, and naturally loved always the sepulchre and the sepulchre of her land where she was born, she fell sick in the castle of Windsor; the which sickness continued on her so long that there was with her no remedy but death. And the good lady, when she knew and perceived there..."
was with her no remedy but death, she desired to speak with the king her husband; and when he was before her, she put out of her bed her right hand, and took the king by his right hand, who was right sorrowful at his heart. Then she said, "Sir, we have in peace, joy, and great prosperity used our time together; Sir, now I pray you, at our departing, that you will grant me three desires." The king right well, "Madam," said the king, "I fully weeping, said, "Madam, desire what you will, I grant it." 

"Sir," said she, "I require you, first of all, that all manner of people, such as I have dealt withal in their merchandise, on this side of the sea, or beyond, that it may please you to pay everything I owe to them or to any other. And, secondly, Sir, all such ordinances and promises as I made to the churches, as well of this country as of the great ones, all that I have had my devo-
tion, that it may please you to accomplish and fulfill the same. Thirdly, Sir, I require you that it may please you to take no other sculpure, whencesoever it shall please God to call you out of this transitory life, but beside me in Westminster." The king, all weeping, said, "Madam, I grant all your desires. Then the government of the kingdom of the sigr, he crossed, and commended the king her husband to God, and her youngest son, Thomas, who was there beside her. And anon after, she yielded up the spirit, the great joy up to heaven." Who is there can read such a passage as this unmoved? Who, that would not rather have such a glimpse of the life, the death of Froissart, and during the short time he stayed there, spent, as he informs us in a very characteristic passage, five hundred francs among the tavern-keepers. This appears to be the only associated memory of Froissart and Lestines. He next attached himself, most probably as secretary, to Wenceslaus, duke of Brabant; and very agreeably the time of their connection passed. The king, all weeping, said, "Madam, desire what you will, I give you a great joy up to heaven."}

The celebrated "ear of Dionysius," whatever may be the truth of the story connected with it, has been known in most countries from a very early period; although the proper mode of explaining it is the result of modern investigation, or, indeed, is not even yet settled.

Many of the accounts given by writers on this subject confound the ear-trumpet with the speaking-trumpet, two forms which do not exactly agree; for the ear-trumpet is intended to collect a large surface of sound, if we may use the term, and convey it to the ear of one who is at a distance; whereas the trumpet is not intended for persons of dull hearing or speech, but for the conveyance of sound to a great distance. Of the latter kind is an instrument described by Baptista Porta:—"To communicate anything to one's friends by means of a tube. This can be done with a tube made of earthenware, though one of lead is better, or of any substance, but very close, that the voice may not be weakened; for whatever you speak at the one end, the words issue perfect and entire, as from the mouth of the speaker, and are conveyed to the ears of the other, which, in my opinion, may be done for some miles. The voice, neither broken nor dispersed, is carried entire to the greatest distance. We have found it at the distance of twelve miles, having convenience for a greater; and the words were heard as clearly and distinctly as they came from the mouth of the speaker."

The celebrated "ear of Dionysius," whatever may be the truth of the story connected with it, shows how prevalent has been the opinion that passages of particular construction may facilitate the transmission of sound. Among the antique cities in Sicily is a series of chambers and galleries, apparently hewn out of the solid rock; and of these the most remarkable is a grotto, from whence issues a winding passage, becoming narrower and narrower as it proceeds. Ancient tradition wills it that this grotto was a prison which the tyrant Dionysius caused to be built for state-prisoners; and that in an apartment of his palace,
which stood over the narrow end of the passage, he could hear everything the prisoners said, or what plots they formed against him. The idea intended to be conveyed by this story evidently is, that the passage in the rock, by getting narrower and narrower as it recedes from the mouth, the sound conducting by which the sound was conveyed to a distance. As to the real truth of the matter, it seems that Dionysius did cause subterraneous prisons to be excavated in the solid rock; but the excavations in question, of which the grotto forms a part, were occasioned by the digging for the stones of which Syracuse was built. The tradition, however, accurately expresses the popular notion as to the voice-conducting effects of lengthened hollow channels.

In Beritaria's 'History of the Order of the Jesuits,' published at Naples in 1601, mention is made of a speaking-trumpet of extraordinary power, as being in use among the native Peruvians. In 1593 a small convent of Jesuits in Peru, situated in a remote corner, was attacked by the devils in the shape of devils and devils... One evening the superior of the convent, Father Samaniac, implored the help of the cacique, or native governor; and on the following morning, on opening the gate of the monastery, he found it surrounded by a large group of people, each of whom carried a small basket of provisions. After presenting his thanks for the gift, he further observed that it was carried in a tube. Sooner afterwards, the emperor caused a tube to be made according to Kircher's description, by which he could hear everything that was said and heard in the room. The sound of one of the lures, being in the porter's room, near the gate, by which the porter could communicate any message to the superior of the convent. The superior asked them in what manner the message was conveyed to the other end of the building, and at such a distance from his own residence. They told him that it was by the trumpet; and that every person heard at his own door the distinct terms of the order. The superior had heard nothing; but they told him that none heard the trumpet but the inhabitants of villages to which it was directed. Professor Robison, in relation to this account, remarks, "This is a piece of very curious information; but, after allowing a good deal to the exaggeration of the reverend Jesuits, it cannot, we think, be doubted but that the Peruvians actually possessed this stentorophonic art; for we may observe that the effect described in this narration resembles what we now know to be the effects of speaking-trumpets, while it is unlike what the inventor of such a tale would naturally and temporarily have fancied."

In the seventeenth century much attention was paid to speaking-trumpets, with a view to determine the best principles of construction. In Kircher's 'Musurgia,' printed in 1650, he describes how a tunnel can be placed in a building in such a manner that a person in an apartment where the narrow end is introduced can hear what is done in the room at the distance of the building, or in another apartment, where the wide end may be. He states that he had caused such a voice-conductor to be fitted up in the Jesuits' college, the voice-end being in the porter's room, near the gate, by which the porter could communicate any message to Kircher when the latter was in his apartment in the upper story. The effect of this tube caused such a surprise that Kircher resolved to make further experiments on the matter. He caused a long tube to be fixed in a particular position; and from a convent, situated on the top of a mountain, he assembled twelve hundred persons to divine service, at the distance of from two to five Italian miles, by reading the Litany through the trumpet, and, by means of the several conduits, the blows of the organ were heard by... Without elevating the voice, he could be understood from Ebersdorff to Neugeben.

About the same time an Englishman, Sir Samuel Morland, took up the same subject, and proposed as a question to the Royal Society of London, "What is the best form for a speaking-trumpet?" He published a folio pamphlet on the subject, in which he describes many forms of speaking-trumpets. Place his trumpet against the wall, and you will hear it. As they were in general very large, they were placed in alleys and corners, through the open air. Provided the tube be continuous throughout, the voice will be conveyed to a distance, whatever be the form of the tube; but it appears...
that in order to increase the actual intensity of the sound, some peculiar form must be given to the tube, and herein lies the difficulty of the investigation. If we take a common pipe of equal diameter throughout, excepting a slight enlargement at one or both ends, it is found that no increase in the intensity of the voice is produced by speaking through the tube, but that it is carried farther in one required direction than it would otherwise be. Thus, the speaking-tubes or pipes which are so much used in manufactories and large establishments, are not intended to strengthen the voice, properly speaking, but to direct it in one particular channel, instead of diffusing its effects in the apartment where the speaker may happen to be: it is a simple case of confinement in direction, and not of augmentation by echo. It is known that a voice may be distinctly heard at the distance of several hundred feet in the Roman aqueducts, whose sides are perfectly straight and smooth; and an experiment made some years ago, by means of the water-pipes of Paris, showed still more strikingly the power of a cylindrical tube in conveying sound to a great distance, simply by confining it laterally. This is in general, more or less, the principle of voice-conductors and ear-trumpets or tubes, in which the mouth of the speaker is placed at one end of the instrument, and the ear of the listener at the other; the listener catches nearly the whole effect of the voice, instead of the latter being diffused equally throughout a room. But in addition to this, the effect of echo in augmenting the sound is brought to the aid of the listener, by giving to the mouth end of the tube such a form as may lead to the reflection of sound along its interior surface, and thus increase the intensity of the sound which reaches the ear. The peculiar curved form of the external ear is supposed to act in a similar manner, by echoing sounds emanating from different directions, and conveying them into the orifice of the ear. In the speaking-trumpet, as distinguished from speaking-tubes, the augmentation of the intensity of the sound, by the peculiar form of the instrument, is the immediate object in view. 

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THE MAMERTINE PRISON, ROME.

During St. Paul's first imprisonment at Rome, he was allowed to remain "in his own hired house with a soldier that kept him." How he was circumstanced in his second imprisonment, to which he alludes in the Second Epistle to Timothy, c. ii., v. 9, we have no means of knowing with certainty; but the probability seems to be that his treatment was then much less favourable than in the first instance it had been. The old ecclesiastical traditions state that, just before the end of their lives, the apostles Peter and Paul were together confined in the Mamertine prison at Rome. Of this joint imprisonment we shall say nothing, nor of that of Peter in particular. But since it seems that St. Paul was kept as a prisoner at Rome, and since it is probable that his treatment was not very favourable, we are inclined to consider it probable that he was kept in a prison; and, if so, we are induced to think the Mamertine prison the more likely to have been the place of his confinement, from finding it frequently mentioned in the old martyrologies as the place in which many of the early martyrs were imprisoned.

The Mamertine prison dates from the earliest times of Rome, being constructed, according to Livy, by Ancus Martius, and enlarged by Servius Tullius. The lower prison, however, assigned to the latter king, is supposed by some to have been a quarry, and by others one of those subterranean granaries which were used in very ancient times. Be this as it may, these prisons, which still exist, offer a striking instance of the durability of Roman works. They occur on the descent of the Capitoline Mount, towards the Forum; and near the entrance were the Scala Gemonize, by which the
culprits were dragged to the prison, or out of it to execution. They consist of two apartments, one above the other, built with large uncemented stones. There is no entrance, except by a small aperture, in the upper part of the wall, and a similar hole in the upper floor leading to the cell below, without any staircase to either. The upper prison is twenty-seven feet long by twenty feet wide; and the lower one, which is elliptical, measures twenty feet by ten. The height of the former is fourteen feet, and of the latter eleven. In the lower dungeon is a small spring, which, when arisen at the command of St. Peter, to enable him to baptize his keepers, Processus and Martinianus, with forty-seven companions, whom he had converted. They also show the pillar to which it is alleged that this apostle was bound. The prison itself, from a small chapel in front, is now dedicated to him; and over it is the church of S. Giuseppe de' Falegnami, built in 1539. Dr. Burton says that a more horrible place for the confinement of a human being can scarcely be conceived; and Sallust, in a passage added by him, says that, from uncleanness, darkness, and foul smells, its appearance was disgusting and terrific. (See Burton's 'Description of the Antiquities of Rome,' 1821.)

THE SYSTEM OF TARTAR TRAVELLING IN TURKEY.

The modes of travelling most prevalently adopted in any particular country furnish a useful index to the social progress of its inhabitants, modified, as it often must be, by the condition of the soil, climate, and the nature of the country. The saddle-horses of most countries, the mules of Spain and of the Alpine districts, the asses of Egypt, and the innumerable forms of vehicle employed by different nations, the system of posting, that of stage-coaches, and diligences—all furnish materials for pleasant study, in relation to the locomotive transactions of a country. Such study is a least curious among these various methods, and is perhaps little known in England. Much discussion has arisen respecting the origin of the name Tartar or Tatar. We apply it (in the latter form) to those roving bands of horsemen who dwell in central Asia, eastward of the Caspian Sea, and who are supposed to have been furnished with a name stock as the modern Turks. There is some reason to believe that it is a kind of general name for a horseman; but be this as it may, the term Tatar is applied throughout the Turkish empire to a horseman who acts as guide and companion to travellers, in a manner unlike anything known in the other countries of Europe. Turkey, from the confines of Hungary and Dalmatia, to those of Persia and Arabia, is wretchedly provided with roads. The unsettled state of the various provinces, the rapacious conduct of the government officers, and the absence of commercial enterprise, all conspire to bring about a state of things very different indeed from that experienced in England. Vehicles are few in number and bad construction; and therefore the mode of travelling on horseback is that generally adopted.

There are three kinds of passports in use in Turkey: the testerî, a simple passport; the bigranti, of a somewhat higher class; and the firman, which is obtained, through the ambassador of the traveller's nation, from the sultan. The last named kind of passport gives the right to have a Tatar as companion and protector, and he is much needed. The posting establishment of Turkey consists of a series of post-houses, placed at various distances apart from each other, that is, from three to sixteen hours each stage, extending along most of the great lines of road through the empire. In those post-houses, horses were kept originally for the use of government alone, that is, for couriers travelling on the business of government. In time, however, this exclusive system was relaxed, so as to suit the convenience of other classes as had interest to obtain orders from the local governments, or were content to pay an established rate of posting. The post-master, or Tatar Agra, is allowed a certain fixed sum from the public treasury, in consideration of which he is required to keep in constant readiness a proportionate number of horses; and these are furnished to all government couriers free of charge, but to other travellers at the rate of one piastre (about twopence halfpenny English) per Turkish hour of road for each horse. Although this appears an extremely low rate of charge, yet the traveller is obliged to have several horses on hire; one for himself, one for a Tatar or companion, one for a soorajee or groom, and one or more, according to circumstances, for baggage and provisions. The comforts of an English inn are unknown in Turkey; so that the traveller must take with him a somewhat miscellaneous assemblage of baggage; and the services of a soorajee become thus necessary on account of the number of horses required.

When on the road, the soorajee generally takes the lead, conducting the baggage; the companion follows; and the Tatar brings up the rear.

Such is the general character of this mode of travelling; and the arrangements are so made that the traveller proceeds at a very rapid rate; indeed by the expression "to travel Tatar" is understood in Turkey to mean travelling on horseback by day and night with only just repose for the horses in the course of the journey. As the horses travel night and day, in cold and wet, resting where they can find a hans or caravanserai, or resting where they can find a hans or caravanserai, or resting where they can find a hans or caravanserai, the reader may perhaps have met with the announcement of a work, three or four years ago, under the title of 'A Winter's Journey (Tatar) from Constantinople to Teheran,' by Mr. Baillie Fraser. This title can scarcely be understood without previous explanation as to the meaning of the word Tatar. In the winter of 1833-34, Mr. Fraser received instructions from the Foreign Department to prepare for a rapid journey to the courts of Turkey and Persia, in which he would have to pass through the entire breadth of the Turkish empire. This journey was performed on horseback, in company with a Tatar; and the horsemen travelled night and day, in cold and wet, carrying with them a Kama and a caravanserai, and journeying on when no sustenance was at hand. Such a journey is called a 'Tatar' journey.

Although the Turkish empire is here spoken of as a whole, yet the provinces of which it consists differ much one from another; those which form the peninsula of Asia Minor being essentially Oriental in their general features, whereas those of Moldavia, Wallachia, and Servia, through which the traveller passes in going from Vienna to Constantinople, furnish a strange mixture of Christian and Mohammedan characteristics. Dr. Boué, who travelled through European Turkey about five years ago, has given some interesting details respecting the Tatar system. Of these courier companions he says, 'They form a particular corporation, which is much respected, and they receive a stipend inscribed in a book, and distributed over the whole empire, at the residence of every pasha. There they live in a house set apart for themselves, called Tartar-han. [Mr. Fraser spells the word Tatar, but Dr. Boué, Tartar.] As they are thoroughly acquainted with European Turkey, they go wherever they go; and being armed with pistols and cutlasses, they always assure them respect, so that the traveller may rely on them with confidence. They are in general a good sort of people; and though drinking a great deal of brandy, are always sober when on the road, and only intemperate when arrived at the end of their journey,'
or when they have plenty of money, and are in a large
town. Their pay is pretty high, being ten francs a day.
In several pashaliks they may be hired at a
lower rate, even for four or five francs a day, especially
when they are engaged to go from the capital to the
traveler in a hurry who may please; but the
traveler who has plenty of money, and is in a
large villa or town will receive the traveler and
to clothe him at a moderate charge. The
leksere is a passport of a general kind, enabling
the traveler to pass whither he may please; but the
pashalik specifications of the other passports are
at once gains the confidence of the Turks: for this
jealous people are ill at ease unless they know
the "who," the "whence," and the "whither," of every
traveler who stops at their towns and villages.
The arrangements just alluded to, however, relate
mainly to those travelers who, being of some note
and station, have a formal way of obtaining a
firman, and who are in no particular hurry.
In such a Tatr journey as that of Mr. Fraser, the case is
widely different. For weeks together he stopped only
when the absolute need of rest compelled, taking up
his abode for a few hours in a wretched han, or a still
more wretched cabin, occupied by dirty and poverty-
stricken tenants, who were often induced to afford the
required accommodation only by a vigorous applica-
tion of the Tatár's whip, for these men exercise a
very influential sway in the humble villages through
which they pass.
In no other country of Europe is a system of travel-
ling followed similar to the Tatár of Turkey. Postil-
ion, companion, courier, horse-patrol, gen-d'armes,
and, according to the kind of order, runs much
parallel to the Tatár. He combines something
of nearly all these within himself, and is part of a
system found only in the Turkish empire.

Passing-Bell.—The word "Passing," as used here, signifies
clearly the same as "departing," that is, passing from life
to death. So that even from the same we may gather that it
was the intention of tolling a passing-bell to pray for the
person dying, and who was not yet dead. As for the title of "soul-bell,"
if that bell is so called which they toll after a person's death is
out, and mean by it that it is a call for us to pray for the soul
of the deceased person, I know not how the Church of England
can be defended against the charge of those who, in this instance,
would seem to tax us with praying for the dead. Bourne con-
derers the custom as old as that of bells there was in
Christian churches, i.e., about the seventh century. Bede, in his 'Ecclesias-
tical History,' speaking of the death of the abbess of St. Hilda, tells
us that one of the sisters of a distant monastery, as she was sleep-
ing, thought she heard the well-known sound of that bell which
was called them to prayers when any of them had departed life.
Bourne thinks the custom originated in the Roman Catholic idea:
the prevalence of prayers for the dead. The abbess above
mentioned had no sooner heard this than she raised all the
sisters, and caused them to be led into the church, and there
pray fervently, and sing a requiem for the soul of their mother.
The same author contends that this bell, contrary to the present
custom, should be tolled before the person's departure, that good
men might give him their prayers, adding, that if they do no
good to the departing sinner, they at least evince the disinterested
charity of the person that prefers them. I cannot agree with
Bourne in thinking that the ceremony of tolling a bell on this
occasion was as ancient as the use of bells, which were first in-
tended as signals to convene the people to their public devo-
tion. It has more probably an after-invention of superstition.
Thus praying for the dying was improved upon into prayer
for the dead. Durand, who flourished about the end of the
twelfth century, tells us, in his 'Rationale,' "when any one
is dying, bells must be rung, and the people may put up their
prayers; twice for a woman and thrice for a man; if for a clergy-
man, as many times as he had orders; and at the conclusion of
the funeral all the bells, to distinguish the quality of the person for
whom they are to put up their prayers. A bell too must be
rung while the corpse is conducted to church, and during the
bringing it out of the church to the grave." This seems to
account for a custom still preserved in the north of England,
and making numerical distinctions at the conclusion of this cere-
mony; i.e., nine knells for a man, six for a woman, and three for a
child, which are undoubtedly the vestiges of the ancient injunc-
tion of popery.—Brand's Popular Antiquities: new edition by
Sir H. Ellis.
Geology of North-Western Australia.—We here remarked a curious circumstance. Several acres of land on this elevated position were nearly covered with lofty isolated sandstone pillars of the most grotesque and fantastic shapes, from which the imagination might easily have pictured to itself forms equally singular and amusing. In one place was a regular unrolling of a mass of massive vertical columns, each six inches in length, one upon another; and upon a pedestal what appeared to be the legs of an ancient statue, from which the body had been knocked away. Some of these time-worn columns were covered with sweet-smelling creepers; while their bases were concealed by a depth of soil which had been trodden by the very singular appearance. The height of two or three which I measured was upwards of forty feet; and as the top of all of them were nearly upon the same level, that of the surrounding country must at one period have been as high as their present summits, probably much higher. From the top of one of these pillars I surveyed the surrounding country, and saw on every side proofs of the same extensive degradation; so extensive, in fact, that I found it very difficult to account for: but the gurgling of water, which I heard beneath me, soon put an end to the state of perplexity in which I was involved, for I ascertained that streams, the course of which was horizontal, were running in the earth beneath my feet; and on descending and creeping into a fissure in the rocks, I found beneath the surface a cavern precisely resembling the remains that existed above ground. I was told that this was roofed, whilst through its opening a stream of water ran. It was now evident to me that ere many years had elapsed the roof would give way, and what now were the buttresses of dark and gloomy caverns would emerge into day, and become columns clasped in the arms of the earth for ever. According to the furnaces the Indians would gradually waste away beneath the ever-during influence of atmospheric causes; and the material being then carried down by the streams through a series of caverns resembling those which they once formed a portion, would be swept out into the ocean, and deposited on sand-banks, to be raised again, at some remote epoch, a new continent, built up with the ruins of an ancient world. I subsequently, during the season of the heavy rains, remarked the usual character of the mountain-streams to be, that they rose at the foot of some little elevated land, and were upon a low table-land composed of sandstone, then flowed in a sandy bed for a short distance, and afterwards mysteriously sunk in the cracks and crevices made in the rocks from atmospheric influences, and did not again reappear until they had reached the foot of the precipice which terminated the table-land whence they sprang: here they came foaming in a rapid stream, which had undoubtedly worked strange havoc in the porous sandstone rocks among which it held its subterraneous course. What the amount of sand annually carried away by this stream is, or the portion of the mountain-sides which the ocean may be, we have no means whatever of ascertaining; that it is sufficient to form beds of sand of very great magnitude, is attested by the existence of numerous and extensive sand-banks all along the coast. One single heavy tropical shower of only a few hours' duration washed down, over a plot of ground which was planted with barley, a bed of sand nearly five inches deep; which the succeeding showers again swept off, carrying it farther upon its way towards the sea.—Gray's Journals of his Expeditions of Discovery.

Causes of Guiana.—The canoes which are manufactured by the Indians consist of the trunk of a huge tree, which has been hollowed out, partly by the axe, partly by the fire. They are sometimes from thirty to forty feet long; and are peculiarly qualified for these rivers, as they draw but little water, and are less subjected to leaking when drawn over cataracts or coming in contact with rocks, than if they were constructed of timbers. A covering of palm-leaves is substituted for an awning. As the largest of these canoes is seldom more than four feet wide, its load must be restricted; and the baggage is generally placed in such a manner that a cataract opposite to farther progress, it may be unloaded and carried over land. . . . The canoe is flat on the bow and stern; and in order to prevent the water from getting into it, two pieces of wood cut according to its shape are fitted in, which the Indian never fails to cut with the same dexterity that his father's hand points towards the stern and bow. Like the canoes, they are scooped out from the trunk of a tree, and have no keel,—which indeed would be quite a superfluous appendage, as it would be soon knocked off by coming in contact with sunken rocks, or when drawn over cataracts. The pahakse, or woods-kin, is a boat of great utility, and generally made of a single piece of the tough bark of the murianaratree, which grows to a very large size. An incision of the length the boat is to possess is made in the bark, which is removed from the trunk by driving in wedges: when loosened from the wood, it is kept for some time in the water; and is mounted at the extremities upon two beams, in order to raise those parts of the intended boat. Vertical incisions, at about two feet apart and a few inches in depth, are then made, and the parts secured afterwards by overlapping. It remains for several days exposed to the weather before it is fit for use. Though the pahakse is so short that very weight or water, it can float where a small corial of the smallest description cannot pass; and are so light, that in crossing cataracts, one man can easily carry his boat on his head. When propelled by one man, he squats in the middle and paddles on either side. Great care is requisite in stepping in or out of them, as, if upset, they sink almost instantly, owing to the great specific gravity of the bark of which they are built.—Schomburgh's Fishes of Guiana.

Indian Mode of Swimming. The mode of swimming among the Indians, as well as among many of the other tribes, is quite different from that practised in those parts of the civilized world which I have had the pleasure yet to visit. The Indian, instead of parting his hands simultaneously under the chin, and making the stroke outward in a horizontal direction, causing thereby a vertical strain upon the chest, levels his arm to his side, he elevates the left and the right side, raising one arm entirely above the water, and reaching as far forward as he can, to dip it, whilst his whole weight and force are spent upon the one that is passing under him, and like a paddle propelling him along; whilst this arm is making a half circle, and is being raised out of the water behind him, the opposite arm is describing a similar arch in the air over his head, to be dipped in the water as far as he can reach before him, with the hand turned under, forming a sort of bucket, and most effectively so as it passes in its turn underneath him. By this bold and powerful mode of swimming, which may want the grace that many would wish to see, I am quite sure, from the experience I have had, that much of the fatigue and strain upon the breast and spine are avoided, and that a man will preserve his strength and his breath much longer in this alternate and rolling motion than he can in the usual mode of swimming in the polished world.—Catlin's Letters on the North American Indians.

Burial in Asia Minor.—The outward marks of respect are scarcely visible in their burial-grounds, little more being left to mark the place of interment than a row of stones, indicating the oblong form of the grave; but a pipe or chimney, generally formed of wood on the entrance, the few inches above the ground, and communicates with the corpse beneath; and down this tube libations are poured by the friends of the deceased to the attendant spirit of the dead. The custom of hiring women to mourn with cries and howlings, is also retained by the modern Greeks at their funerals.—Papen's Asia Minor.
THE SCOTCH FIR.

What is called English scenery derives much of its peculiar beauty and character from the noble and stately trees by which it is adorned. The eye ranges with pleasure over verdant meadows and rests with delight upon the massive foliage of the oak and beech, the elm and chestnut, on which the lights and shadows are reflected in such rich and varied colours. These trees especially are the appropriate embellishments of a landscape in which the hand of man is everywhere visible, and nature appears in her elegant rather than in her wilder and less cultivated forms. The chestnut, with its rich blossoms and luxuriant foliage, would seem as much out of place in a Scottish landscape, whose outline is marked by the blue heather and the bare mountains, as it is appropriate in an English park. The tree which of all others best combines with the rugged scenery of the land of the mountain and the flood is the pine; and it possesses the same sort of national character that the oak claims in England. A truly national poet, Sir Walter Scott, in the 'Lady of the Lake,' has dedicated one of his most spirited songs to its praise; and our readers will not regret the reproduction of two of the stanzas in this place:

"HIGHLAND BOAT SONG."

"Hail to the Chief, who in triumph advances.
Honour'd and bless'd be the ever-green Pine!
Long may the Tree, in his banner that glances,
Flourish, the shelter and grace of our line!"

"Heaven send it happy dew,
Earth lend it sap anew,
Gaily to bourgeon and broadly to grow,
While every Highland glen
 Sends us shout back again.
Roderigh Vich Alpine dhu, ho! ieroe!"
"Outs is no sapling, chance-sown by the fountain, 
Blossom at Beltane, in winter to fade;
When the whirlwind has stripped every leaf on the mountain,
The shape shall Claw-Alpine exult in his shade,
Moord in the rifted rock,
Proof to the tempest's shock,
Firmer he roots him, the ruler it blow;
Menteith and Braidalbane, then,
Echo his praise again,
Roderigh Vich Alpine dhun, ho! Jeroe!"

Those who have only been accustomed to see the Scotch pine ignominiously made use for no other purpose than to screen a house from the ungenial winds, or to see a number of them planted together to perform the part of 'nurses,' by sheltering the less hearty trees and shrubs of the plantation, will perhaps suppose that the poet has been led away by the fervour of his patriotism. Thickly planted in a heavy clay soil, the Scotch pine vainly attempts to develop its most of character. Seen under these disadvantages, it may not be undervaluing of the stigma which Mason, in his poem of the 'Garden,' endeavoured to attach to it, Gilpin, who had seen the tree on its native mountains, attempted, in his 'Forest Scenery,' to establish its character as a picturesque object of the landscape. But much of the beauty of the haunts themselves, have mistaken an inferior species for the true Scotch fir. In an article, written by Sir Walter Scott, in the 'Quarterly Review' (No. 82), it is said: "We may remind the young planter, that the species of fir, which in an evil hour was called Scotch, as now generally found in nurseries, is very inferior, in every respect, to the real Highland fir, which may be found in the North of Scotland in immense natural forests, equally distinguished for their romantic beauty and national importance. This last is a noble tree, growing with huge contorted arms, not altogether unlike the oak, and forming therein a strong contrast to the formality of the common fir. The wood, which is of a red colour, is equal to that brought from Norway; and, when a plant, it may be known from the spurious of common fir by the tufts of leaves being shorter and thicker, and by the colour being considerably darker.

The appearance of the Highland fir, when planted in its appropriate situation amongst rocks and crags, is dignified and even magnificent; the dusky red of its bark, and the dark brown of its leaves, forming a happy accomplishment to scenes of this description. Such trees, therefore, as are ultimately designed to remain as principal trees, ought to be of this kind, though it may probably cost the planter some trouble to procure the seed from the Highlands. The ordinary fir is an inferior variety, brought from Canada not more than half a century ago. Being very prolific, the nursery-gardeners found it easy to raise it in immense quantities; and thus, though a mean-looking tree, and producing wood of little comparative value, it has superseded the natural plant of the country, and is called, par excellence, the Scotch fir. Under that name it has been used generally as a nurse, and so far must be acknowledged useful, that it submits almost to any degree of hard usage, as, indeed, it seldom meets with any which can be termed even tolerable. There is a great difference between the wood, even of this baser species, raised slowly and in exposed situations, and that of the same tree produced upon richer soil—the last being much inferior in every respect, because more rapid in growth.

Another patriotic Scotchman, Sir Thomas Dick Lauder, defends the arboreal emblem of his country in language scarcely less enthusiastic: "When its foot is amongst its own Highland heather, and when it stands freely on its native knoll of dry gravel or thinly covered rock, over which its roots wander far in the wildest reticulation, while its tall, furrowed, often gracefully sweeping red and grey trunk of enormous circumference raises aloft its high unbranched canopy, then would the greatest sceptic on this point [its picturesque sequences] be compelled to protest his belief before it with a veneration which perhaps was never before excited by any other tree." We presume that enough has now been said on this part of the subject. Within a short distance of London there are some very fine specimens of the tree. Those at Ham House, near Richmond, are seventy feet high; the trunk four feet in diameter, and the top eighty feet. The trees at Whitton, near Hounslow, are above a century old, from eighty to ninety feet in height, and standing singly, their forms are very picturesque. There are also some fine trees at Muswell Hill and Pain's Hill, on the north of London. At Dropmore, in Buckinghamshire, there is a Pinetum, or collection of numerous species of the genus Pinus.

There are between fifty and sixty species of the Pinus genus; and some naturalists carry the number to upwards of seventy. Of the Scotch pine, which is found all over Europe and a great part of Asia and America, there are many varieties produced by the difference of soil and climate. The Pine of Haguenau, a village on the Rhine, is the most interesting of those trees by which we must refer to Mr. Loudon's elaborate 'Arboriculture Britannicum' for an account of them. There are forests of the Scotch pine, both in the plains of Russia and Poland, and the mountains of Norway and Sweden; it flourishes in the Alps and Pyrenees, and in the south of Europe, and has been extensively planted in England, especially in Wales, within the last fifty years. The Scots pine, although an inferior species, preserves from damp; but in England, where its growth is usually too rapid, the quality of the timber deteriorates, it loses its red hue and is almost white, containing little resin, and cannot safely be made use of for buildings which are intended to last many generations. But when grown in favourable situations its value as timber is only inferior to the oak, and it is more easily worked. It is used by the shipwright as well as in the building of houses. A specimen at Gordon Castle in Scotland, one hundred feet high, contained two hundred and sixty feet of timber exclusive of the branches. The growth of its lower branches is very rapid; and in old trees the mid-branches hang gracefully pendent, instead of turning upwards or being horizontal; but the top-branches 'bourgeois' freely and amply. The tree will sometimes continue to grow for two, three, or even four centuries, in a soil and climate adapted to its nature; but the ordinary period of maturity is fifty or sixty years. The foliage assumes its proper hue when the tree reaches its second year; but the young shoots put forth in spring are of a lighter colour than the old leaves, which are retained between four and five years. Mr. Loudon, in the work already alluded to, gives the following statements of the progressive growth of the Scotch pine:—During the first year the growth is three or four inches; in the second, if the soil be favourable, from four to six inches; in the third year branches are put forth, and the tree increases fourteen inches, or perhaps two feet; in the fourth and fifth years, if not transplanted, or if they have been carefully transplanted in the second year, they make a leading shoot of from one to two feet. The climate of London, Mr. Loudon says that at the age of ten years the tree will have attained an average height of from twenty to twenty-five feet; and at twenty years of from forty to fifty feet. He quotes an instance, from Evelyn's 'Sylva,' of a Scotch pine which grew to a height of sixty feet in little more than twenty years.
Differences of East India Population.—The greatest difference is between the inhabitant of Hindostan Proper and of the Deckan. The neighbouring parts of these two great divisions naturally resemble each other; but in the extremities of the north and south the languages have no resemblance, except from a common origin of the Mahometans; their houses are tiled and built in compact villages in their tracts; their dwellings are composed of thatched cottages, scattered through woods of banyan or palms; their dress is the old Hindú tunic, formed by one scarf round the middle and another thrown over the shoulders. They have the practice, unknown in Hindostan, of rubbing their limbs with oil after bathing, which gives their skins a sleek and glossy appearance, and protects them from the effect of their damp climate. They live almost entirely on rice; and one of the grains, that is, two hundred and eighty-seven grains, had multiplied itself into nine hundred plants, and the second grain into nine hundred and sixteen. These, he informs us, he again planted in rows, in a field along side of other wheat sown in the ordinary way, having nothing to support the stalks or to divide them several times. Whether this mode of growing wheat would answer in a pecuniary point of view would depend upon the extra cost of labour compared with that of the saving of seed and the extra production, as to which we have made no calculation, but believe the increased expense would be greater than the increased profit, though we have no doubt that there would be an extra production over the common mode of cultivation.

Dr. Clarke was not the first who made the experiment of planting two grains of wheat. Mr. Miller, curator of the botanical garden at Cambridge, had the priority. This gentleman planted a single grain of wheat on the 2nd of June, which was taken up and divided into eighteen parts, which were again divided between September and the middle of October, and made them in the whole sixty-seven plants. The last division was made between the middle of March and the 12th of April; this produced five hundred plants, that is, four hundred plants less than were produced in Dr. Clarke's experiment. The five hundred plants of Mr. Miller produced 21,109 ears, and these ears, by computation, 21,540 grains. We are told that the stalks were supported by stakes; and that the whole crop was covered by netting to protect it from the depredations of birds. On the contrary, Dr. Adam Clarke says, they were left alone, beside which bladles of grass grew where one only grew before, is a real benefit to mankind. If this assertion will hold good as respects Corree, the Government and general subjects, their ceremonies and way of life, that a European, not previously apprised of the distinction, might very possibly pass the boundary that divides them without at once perceiving the change that had taken place.—Edimpoton's Hist. of India.

Milk as an Article of Diet.—For those who have healthy and unsophisticated stomachs, milk appears to be one of the best articles of diet we possess. It is less stimulating than flesh, and more nutritious than vegetables. For persons who are disposed to febrile complaints, and who are not obliged to perform hard and exhausting labour, it is the most appropriate diet. But the stomach is a creature of habit. It can become accustomed to the usual diet, and sudden changes are liable to derrange its healthy action. To those who are accustomed to what is called high living, such as strong meats, strong drinks, and high-seasoned food of all kinds, the transition to a milk diet, which contains a considerably lessened stimulus, is at first difficult. Without necessary, the change should be so gradual that the stomach should by degrees become accustomed to it.—Beauvoir's Experiments on the Gustive Juice, &c., by Dr. Combe.

Use of Gorse, or Furze.—In the neighbourhood of Birmingham there are several large dairy establishments in which gorse is used as an article of food. There is a small steam-engine attached to each, by which the gorse is crushed to fineness, and that state it is given to cows, which soon become very fond of it. A friend of mine feeds his plough horses almost entirely on this food, and they both look and work remarkably well.—Correspondent.
ROMAN BRIGANDS.

Our cut is taken from one of a series of etchings published at Rome, and entitled 'A Collection of Fifty Customs of the Neighbourhood of Rome, comprising divers deeds of the Brigand; designed and etched by Bartolomeo Pinelli;' and is engraved in the broad style of the original. This Signor Pinelli was a very remarkable man. His person was as picturesque as his pictures; and his adventures, if common report at Rome spoke truly, had been hazardous and romantic. His designs would be very inadequately described in being called costumes. They represent the sports, the occupations, and the modes of life of the peasantry of the Campagna, and of the popular orders in Rome, more especially of the Trasteverini, or inhabitants of that part of the city that lies beyond the Tiber—a somewhat quarrelsome and unruly people, but handsome, athletic, and spirited to a degree that entitles them to be considered as the real descendants or representatives of the ancient Romans. But the subjects which Pinelli preferred, even to the fiery Trasteverini, were the brigands or banditti, who were in a very flourishing state in his day, and among whom he is said to have fallen more than once. He portrayed these heroes in a great variety of situations, making them, with their sugar-loaf hats, velvet-even jackets, sandalled feet, fierce countenances, and murderous long guns, almost as striking and picturesque as the banditti figures of Sal- vator Rosa, with their morroons and cuirasses of plated steel, their mantles of scarlet, their glaives and spears. But into whatever he did, Pinelli threw a wonderful degree of truth and life. We believe he rarely painted, but he always etched his own designs. It is, indeed, upon his etchings, which are very far from being numerous, that his reputation as an artist depends. For spirit and beauty of drawing they have not been surpassed in modern times. They have claimed the attention of all travellers of taste that have visited Rome within the last five and twenty years; and impressions of his plates have been carried to every part of the civilized world. Pinelli died at Rome about three years ago, we believe. If he had written his own life, it might, it is said, have told stories of himself which would have rivaled some of the adventures of Benvenuto Cellini, as described by that famous and turbulent old sculptor in Memoirs of his writing, and which are written with the same genius and fire that he employed on his best statues; or Pinelli might have surpassed the tales told by Lady Morgan in her 'Life of Salvator Rosa,' which book is a sheer romance from beginning to end, and with scarcely more verisimilitude than fact. But we believe that Pinelli, whose besetting sins were idleness and dissipation, never wrote anything either about himself or any one else; and we should doubt, from the slight personal knowledge we had of him, whether he had any deep tincture of letters.

The brigands upon whom he exercised his pencil and etching-needle, chiefly abound, or rather abounded (for, happily, we may almost use the past tense), in the wild country bordering on the Pontine Marshes and the frontiers of the kingdom of Naples. There they were favoured by many local circumstances. On the side of the Roman states is a wide plain, unhealthy, and very thinly inhabited, intersected in many parts with canals, rivers, rivulets, ditches, marshes, and dotted here and there with thickets, underwood, and forests: near the seaboard it is for many miles what the Italians call a Maremma, or fen-country, thickly wooded, swampy, and in summer time pestiferous—only fit to be inhabited by wild-boars that swarm, and by the buffa-loes that are reared, there in great numbers, or by the banditti who occasionally sought and found security from pursuit in its mazes. On the Naples side there is a mountainous country, as thinly inhabited as the Campagna and the Pontine Marshes; the Apennines, which stretch through the Neapolitan provinces of the Abruzzi, and there attain their greatest elevation, abound with forests, defiles, chasms, rocks, caves, and all kinds of convenient hiding-places, and are traversed by hardly any roads. It is a country as wild and as picturesque as the wildest parts of Wales or the high-lands of Scotland may have been before roads were made, and trade and industry introduced; the difference being, that the mountains are two or three times higher, and the climate incomparably finer. There are other obvious points of dissimilitude, among which we may mention that wolves are very abundant, and bears...
bivated the church, they wheeled round, and, through some fate was as much milder than his fame had been greater, got back into the kingdom than that of his predecessor. Benedetto Mangone, other bands, under separate chiefs, scattered through being captured by Spanish troops, was carried into the dominions of the church; if molested in the dominions of the church, they wheeled round, and, through some dangerous mountain-pass, got back into the kingdom. Other bands, under separate chiefs, scattered through the Papal States and the farther-off regions of Tuscany, courted his friendship, and sent him assistance in arms and ammunition. After a long reign for that sort of potentate, being very closely pressed by a regular permanent force, sent against him by the Pope, Charles, sent him assistance in arms and ammunition.

The greater part of Italy being no better governed between that fair city and the mountains of the Abruzzi, than the Neapolitan kingdom, and being cut up into little states, with numerous frontiers, and an abundance of woods, mountains, and maremamas, there was no lack of other parts; but the bands were altogether insignificant, compared with the army in the Abruzzi. So great was the disaffection of the Neapolitans under the Spanish viceroys, that several of the great nobles, who had estates in the Abruzzi, connived with King Mark, and not a few of men of education and superior condition, flying from the tyranny of Spain's robber-chief. At one time the two armies were sent against him, one by the viceroys, joined the robber-chief. At another time the king of the Abruzzi, swept a great part of the Abruzzi side and the Campagna, had little to fear, and were at times benefited by the greater and bolder bands of robbers, who thus acquired that dangerous sort of consideration once enjoyed in England by Robin Hood, who was said to rob the rich in order to feed the poor. From these and other causes, this be levied there. He was so considerable, and occu
Dr. Radcliffe and the Radcliffe Library.

John Radcliffe, the founder of the library, was in every respect a most remarkable man. In an age of professional pedantry, he wholly threw off its trammels; though a lover of money, he knew how to be generous, nor could any regard to his interest reduce him to flattery or servility; though not devout, he withheld every petition addressed to his sovereign, James IV., to become a Catholic; though practical and even rude, his friends were eminent and many, and much attached to him; and though somewhat intemperate and too much attached to the pleasures of the table, yet his excesses do not seem to have ever disabled him from the active duties of his profession, though they may have shortened his life, and he himself, in a letter written a few days before his death to the Earl of Denbigh, has expressed his feeling thereon with an earnestness, of which probably few would wish to increase the severity, or not respond Amen to the prayer. This letter concludes thus:—'The pain that affects my nerves interrupts me from making any other request to you, than that your lordship would give credit to the story of a living man, who is fearful that he has been, in a great measure, an abettor and encourager of your intemperance, and would therefore in these last moments, when he is most to be credited, dehort you from the pursuit of it: and that in these the days of your youth (for you have yet many years to live, if you do not hasten your own death) you would give more attention to the preacher, whom you and I, with the rest of our companions, have, on our return from our debauches, made light of for saying, 'Rejoice, Oh, young man, in thy youth, and let thy heart cheer thee in the days of thy youth, and walk in the ways of thy heart, and in the sight of thine eyes; but know thou that for all these things God will bring thee to judgment.' On which day, when the hearts of all men shall be laid open, and the vision appear before his death, he fell to the activeduties of his profession; and it seems to have been but small; Dr. Bathurst, the president of Trinity College, on hearing to see his library, pointed to a skeleton, a few vials, and a herbal, saying, 'That, sir, is Radcliffe's library.'

After practising as a physician with much success at Oxford, he removed, in 1684, to London, where his wit and readiness, as well as his skill, made him in a short time a great favourite with both sexes, and procured him a most lucrative practice; he was elected physician to the Princess Anne, in 1686, and after the Revolution of 1688, he was left over the medical practice of London, after having performed two remarkable cures on M. Bentinck and Zulenstein (afterwards Lords Bentinck and Rochford), he was offered that of physician to William III. This office, however, he declined, but continued to attend the king in cases of illness. The following anecdote will give a good illustration of the Doctor's manner, and of the freedom which he exercised. In 1677 the king was indisposed, and the medicines prescribed for him seemed rather to increase than remove his disorder. Dr. Radcliffe was sent for, and on arriving found the king reading Sir R. L'Estrange's version of 'Æsop's Fables.' His majesty then informed him that he had again a wish to have recourse to his skill, as his other physicians appeared to be not aware of his inward decay, but promised him a speedy recovery, and a life of many years. Upon which, the Doctor having put some interrogatories to him, very readily asked leave of the king to turn to a fable in the book before him, which would let him know how he had been treated, and read it to him in the following words:—'Pray, sir, how do you find yourself?' says the doctor to a sick patient; 'there is this violent sweat.' 'Oh! the best sign in the world,' quoth the doctor. And then, a little while after, he is at it again, with a 'Pray, how do you find your body?' 'Alas!' says the other, 'I have just now had a terrible fit of horror and shaking upon me.' 'Why this is all as it should be,' says the physician; 'it shows a king's strength of nature.' And then he comes over him the third time, with the same question. 'Why, I am all swelled,' says the other, 'as if I had the dropsy.' 'Best of all,' quoth the doctor, and does his way. Soon after this comes one of the sick man's friends to him with the same question, 'How he felt himself?' 'Why, truly,' says he, 'so well that I am even ready to hope of I know not how many good signs and tokens.' 'May it be,' says the friend, 'that you, yours and the sick man's case is the very same; you are buoyed up with hopes that your malady will be driven away by persons that are not apprised of means to do it, and know not the true cause of your ailment: but I must be plain with you, and tell you, that in all probability, if your majesty will adhere to my pre-scriptions, it may in the course of nature recover itself. It is four or five years, but beyond that time nothing in physic can protract it, for the juices of your stomach are all vitiated: your whole mass of blood is corrupted, and your nutriment for the most part turns to water. However, if your majesty will forbear making long visits to the Earl of Bradford's (where the king was wont to drink very hard), I'll try what can be done to make you live easily, though I cannot venture to say I can make you live longer than I have told you;' and so left a recipe behind him, which was so happy in its effects as to enable the king not only to make a progress in the western part of his kingdom, but to go out of it, and divert himself at his palace of Holland.* His intercourse with the celebrated Prince Eugene of Savoy is also characteristic. 'The Chevalier de Soissons, his highness's nephew, in a nightly encounter with the watch, was so bruised that he was thrown into a violent fever, which was falsely said to terminate in the small-pox, to cover the reproach of such an unprincely disaster. Hereupon Dr. Radcliffe being called upon for his advice, very frankly told the prince that he was extremely concerned at an event so dear and nearly related to him as the Chevalier, since the Sieur Swartenburgh, his highness's physician, had put it out of his power by mistaking the nature of the distemper: but that he should hold it amongst the greatest honours he had ever received, if he might have the happiness of entertaining so great a general, to whose noble achievements the world owes so much at his poor habitation. In pursuance of this invitation the prince paid him a visit. "The Doctor made provision accordingly; and instead of ragouts and other fine kickshaws, wherewith other tables had been spread, ordered his to be covered with barons of beef, jiggets (legs) of mutton, legs of pork, and other such substantial British dishes, for the first course, at which

* Memoirs of the Life of John Radcliffe, M.D., interspersed with several original Letters, &c. 1715, to which scarce work, and to Ingram's Memorials of Oxford, we are indebted for most of the materials of this notice.
several of the nobility, who were perfect strangers to whole joints of butcher's meat, made light of his entertainment. But the prince, upon taking his leave of him, said, in French, 'Doctor, I have been fed at other tables like a courtier, but received at yours as a soldier, for which I am highly indebted to you, since I must tell you that I am more ambitious of being pleased by the latter than by the former. Nor can I wonder at the bravery of the British nation that has such food and such liquor (meaning some beer he had drank of seven years old) of their own growth as what you have thus given proof of.' His life abounds with such anecdotes, and many of them show his strong disgust at meanness or assumption, while he was no.niggardly himself; for instance, he sent word by a servant to Radcliffe, that unless this was put a stop to, he should be obliged to brick up the door. The doctor, choleric by nature, replied 'that Sir Godfrey might do what he pleased with the door, so that he did not paint it.' Hereupon the footman, after some hesitation in the delivery of his message, and several commands from his master, went to give it him word for word, told him as above. 'Did my very good friend Dr. Radcliffe say so?' cried Sir Godfrey; 'go you back to him, and after presenting my service to him, tell him that I can take anything from him but physic.' The painter here had certainly the advantage over the physician both in wit and temper.

Dr. Radcliffe lived and died unmarried. Within five years of his death, he fell in love with a patient of rank, wealth, and beauty; he was rejected, and his offer made known to Sir Richard Steele, by whom he was ridiculed in the 'Tatler,' No. 44. Isaac Bickerstaff says, 'I saw a gay gilt chariot drawn by fresh prancing horses; the coachman with a new cockade, and the lackeys with insignia of state and dignity, as if he were a seventh son. This John Kidd, M.D., of Christ Church, Regius Professor of Botany, surgery, and natural philosophy. The eleventh of March, 1734, a view of the exterior given. It was completed in 1747, and opened in a most solemn manner, on Thursday, April 13, 1749; when the Duke of Beaufort, on behalf of himself and the other trustees, formally delivered the key to the vice-chancellor 'for the use of the University.' The first librarian was the Rev. Francis Wise, B.D., of Trinity College: the present one is Adam Kidd, M.D., who takes care of the botanical and physical curiosities, and the medical library.

The doctor had been a sufferer from the gout, and of this he died on the 1st of November, 1714; but his end was embittered, if not hastened, by the unpopularity and hatred which assailed him on the death of Queen Anne. Some years before, the doctor was dismissed from his office of physician to the queen, in consequence of his negligence and rudeness in not attending when sent for, saying, 'Nothing ailed her but the vapours.' But in her last illness it was asserted he had been again scut for, and refused to visit her. This was not the truth; he had shown the greatest anxiety about her, and had been in constant communication with Dr. Mead, his friend; but two hours before the queen's death, Lady Masham had sent an unofficial message to him, requiring his presence, upon which he of course could not act; but the belief was so strong, that it was mentioned in parliament, and he received in consequence many threatening letters, to which he feelingly alludes in the letter in the Earl of Denbigh from which we have previously quoted. His body lay in state at Carshalton, where he died, and was thence removed to Oxford, where it was interred with great pomp in St. Mary's church.

It only remains to give some account of his posthumous benefactions, which were indeed most munificent, and for this we borrow from the 'Penny Cyclopædia.' After making a life provision for some of his relations, he bequeathed his whole fortune to be used in establishing the Flora Graeca, and founder of the Professorship of Agricultural Botany.
Headbourne Worthy, in Hampshire, to trustees for the benefit of University College for ever, so that a member of that society should always be presented to it on every vacancy. He gave the same college during his life £4,000 besides hundreds of pounds for improvements in their exhibitions and for general repairs, and the painted window at the east end of their chapel appears to be his gift, by the following inscription under it:—


After the payment of the bequests above mentioned, he gave to his executors, in trust for the College at Oxford, in Hertfordshire, Yorkshire, Northamptonshire, and Surrey, to be applied in such charitable purposes as they all, in their discretion, should think best; but no part thereof to their own use or benefit.

The present trustees are Lord Sidmouth, Sir Robert Peal, W. H. Ashurst, Esq., W. R. Cartwright, Esq., and T. G. Bucknall Estcourt, Esq. Out of these funds were built the Infirmary (1770) and the Observatory (1772) at Oxford, and the Lunatic Asylum on Hedington Hill near that city also received so much assistance from the same source (1827), that the committee gave it the name of the 'Radcliffe Asylum.' In 1825 the trustees gave two thousand pounds towards building the present College of Physicians in London, and they have ever been found ready to contribute, according to their means, to every charitable and useful purpose.

Laudable Custom of Professor Porson.—According to Dr. Adam Clarke, it was the custom of Porson, when he quoted any author in the learned languages, to translate what he had quoted. This was a peculiar and exceedingly praiseworthy delicacy in his character. He could not bear to see a man confounded (unless he knew him to be a pedant), and, therefore, though he might presume that the person to whom he spoke understood the language, yet because it might possibly be otherwise, and the man feel embarrassed on the occasion, he always paid him the compliment of being acquainted with the subject, and saved him, if ignorant, from confusion, by translating it. How different this conduct on the part of a profound scholar, to that of the would-be-learned, who, having got a few scraps of a foreign language in their heads, seek to confound the mere English scholar by uttering that which they know he does not understand. A truly sensible well-informed man will never argue for the sake of arguing, much less for the sake of victory, at the expense of his companion. Such a man is as willing to learn as he is to teach. His object in conversation is not to confound, but to gain information and to impart it. "Professor Porson," Adam Clarke says, "always thought in Greek, and when in his last illness, he found it more easy to pronounce Greek than his mother's tongue."

Gibraltar in January.—And now, my dear ——, what shall I say to you of this wonderful rock? Nothing can exceed the beauty and variety of the vegetation with which its mighty bosom is all over embroidered. What think you, at this season, of clusters of the white and odoriferous narcissus-polyanthus, and white blossom of lavender-flowers of the deepest purple and most aromatic fragrance? Every five yards you encounter beautiful shrubs, of which I know not even the names; and the broad rough stems and fan-like foliage of the palm-like mingles with in wild abundance with the gigantic leaves of the aloes and the succulent and unwieldy bunches of the prickly-pear. Some parts are all blue with periwinkles; and here and there the wild tulip shows half its bulb, about the size of a turnip, among tuffs of the most delicious herbs. Lower down are almond and damascene trees in flower; while the noble old palm trees in gloomy majesty rise by side with the light and felicity of the cherry tree. The atmosphere—it is indeed Paradise to breathe it! All is fragrance, verdure, and bloom. The indescribably beautiful Almeyda, with its germanium hedges and gorgeous coloured flowers, I had explained for you at the base, where the blue surface of the Mediterranean, backed by the bold outlines of the Granada and Barbary hills, finishes the picture. You have no idea what a nice, little, clean, pretty, bustling town Gibraltar is. The fortifications are a source of astonishment and delight to me. Their extent, size, and beauty must be seen to be appreciated. And as for the streets—there you behold a daily masquerade of nations! You are absolutely bewildered with the incessant variety of feature, complexion, and costume which you encounter at every step. The world comes on the tip of their toes to see the exhibition, and, shadowed by his black steely-heel; the turlanced Moor, with his clear olive cheek and large eye; the scarlet skull-cap of the Lombard Greek; the African Jew, with his hideous cowl of striped cloth; the Turk, the Negro, the Italian, and, though last not least, the well-fed, fair, and comely Englishman, mingle in the variegated gala of this romantic town.—

Daniel Lambert.—Though our town could not vie with the Island of Hercules, we have produced the largest and heaviest man in the world. Daniel Lambert and myself met together, and as I lived next door to him, I watched his growth for several years. At the age of ten he was a tall, strong lad, of a very quiet disposition, not at all inclining to be fusty, but possessed of the best of temper. He had the fine boned face of a negro, his eyes blue with periwinkles; and here and there the wild tulip shows against his will; and he first submitted to be shown for a sight half its bulb, about the size of a turnip, among tulls of the most exquisite beauty and variety of the vegetation, which its mighty bosom is all over embroidered. What think you, at this season, of clusters of the white and odoriferous narcissus-polyanthus, and white blossom of lavender-flowers of the deepest purple and most aromatic fragrance? Every five yards you encounter beautiful shrubs, of which I know not even the names; and the broad rough stems and fan-like foliage of the palm-like mingles with in wild abundance with the gigantic leaves of the aloes and the succulent and unwieldy bunches of the prickly-pear. Some parts are all blue with periwinkles; and here and there the wild tulip shows half its bulb, about the size of a turnip, among tulls of the most delicious herbs. Lower down are almond and damascene trees in flower; while the noble old palm trees in gloomy majesty rise by side with the light and felicity of the cherry tree. The atmosphere—it is indeed Paradise to breathe it! All is fragrance, verdure, and bloom. The indescribably beautiful Almeyda, with its germanium hedges and gorgeous coloured flowers, I had explained for you at the base, where the blue surface of the Mediterranean, backed by the bold outlines of the Granada and Barbary hills, finishes the picture. You have no idea what a nice, little, clean, pretty, bustling town Gibraltar is. The fortifications are a source of astonishment and delight to me. Their extent, size, and beauty must be seen to be appreciated. And as for the streets—there you behold a daily masquerade of nations! You are absolutely bewildered with the incessant variety of feature, complexion, and costume which you encounter at every step. The world comes on the tip of their toes to see the exhibition, and, shadowed by his black steely-heel; the turlanced Moor, with his clear olive cheek and large eye; the scarlet skull-cap of the Lombard Greek; the African Jew, with his hideous cowl of striped cloth; the Turk, the Negro, the Italian, and, though last not least, the well-fed, fair, and comely Englishman, mingle in the variegated gala of this romantic town.—

—Orator's Fragment.
Few of our writers possess a more abiding place in the hearts and memories of the people than the author of 'The Traveller,' 'The Deserted Village,' and 'The Vicar of Wakefield,' and few have drawn so entirely from their own personal observations and experiences. Byron has impressed his own stamp on all his productions, but it is only of himself as an isolated individual; and Burns has sung his feelings in varied situations, but his mind has projected itself into a wider sphere, from whence he acquired a knowledge of and a power of depicting human character far beyond his own personal experience. To all of them, however, this quality has given them an earnestness and a reality that strikes at once on the heart of a reader. In Goldsmith this is united to an amiability and kindness that render him more like a companion, and in which, and in his simple truthfulness, he more resembles Cowper than any other of our poets. 'The Traveller,' commencing with a feeling recollection of home, describes the characteristic features of the European nations which he had visited, and in some of which he had partaken of the enjoyments he narrates. In 'The Deserted Village,' Auburn is Lissoy; every spot and every person is identified; and his beau-ideal of poli-

(GOLDSMITH—from the Portrait by Sir J. Reynolds. Goldsmith's Mill at Auburn—from a picture painted by Creswick.)


In June 11, 1745. Here he continued, with mutual dissatisfaction to himself and his tutors, till February, 1749, when, notwithstanding suspensions, reprimands, his struggles with poverty (to relieve which it is said he wrote street ballads for which he received five shillings each), and numerous stories of his idleness and eccentricities, he was in due course admitted to the degree of B.A.

His father had died while he was still at college, and his mother, much reduced in circumstances, though not without some relief, was left to provide for her two sons at Dr. Milner's school, furnished by a lady, the widow of a clergyman. Mr. Prior has stated that the first was placed there on January 28, 1750; the other, the first week after Easter, April 15, 1751. He said Mr. Oliver Goldsmith was about twenty-three; a dull heavy-looking man. This gentleman, with his sons, left Camberwell for Wokingham, in July, 1754. Mr. Prior, in his Life of Goldsmith, says, he "went there towards the end of 1756, or the beginning of the following year," and adds a statement of Miss Milner's, that he was with her father about three years; this, as he himself observes, must be erroneous, as incompatible with his other well-ascertained occupations; and in addition, Dr. Milner died in June, 1757. From the end of 1750 till the autumn of 1752, when we find him at Edinburgh, a space is found for this engagement, which we find at no other period of his life; and as he continued his acquaintance with the family, he may have visited frequently at the latter period, and there become acquainted with Griffiths as is commonly stated. The house still exists at Peckham, and is known by Goldsmith's name.

With the assistance of his friends, Goldsmith, it is certain, went to Edinburgh to study medicine, and thence, to complete his education, to Leyden in 1754. At both places he evinced his usual eccentricities, and his letters, from their style and subjects, show more attention to literary than to medical art, in the latter of which he was not vociferous; his professor, who wrote street-ballads, for which he received five shillings each), and numerous stories of his idleness and eccentricities, he was in due course admitted to the degree of B.A.

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at the end of five months; he next contributed to the "Literary Magazine," and thence commenced his literary drudgery, which continued throughout his life with a few short intervals, but—what few others have had—he had strength to emerge from this slough, and "Mount far off among the swans of Thames."

While pursuing this course, he lived, in 1757, in a court near Salisbury Square; in 1758, at No. 12, Green Arbour Court, Old Bailey; in 1760, at Wine-Office Court, Fleet Street; and occasionally at Canonbury House; in 1767 he removed to the Temple, where he occupied successively apartments in 2, Garden Court, in King's Bench Walk, and No. 2, Brick Court, where he died.

Having thus gone through his residences, we now return to detail the principal incidents of his career. In 1758 he endeavoured to procure a medical appointment to India, but was rejected by the College of Surgeons for want of being sufficiently qualified. In 1759 he wrote "An Inquiry into the present State of White Learning in Europe," a clever work in thought, and pleasing in style, but incomplete in its information; and he also contributed to the "Bee." In 1760, in conjunction with Smollett and others, the "British Magazine" was undertaken, and in Newbery's paper, the "Public Ledger," he gave to the public his "Citizen of the World," and the "History of Miss Stanton," the first germ of his "Vicar of Wakefield." About this period he seems to have passed his summer months in a lodging at Canonbury House, and while here he published his "Traveller," and wrote his "Vicar of Wakefield." This latter has been stated to have been written on the spur of a pressing necessity; but, as we have noticed, he could play Punch better than the performer, was raising to himself the reputation of a writer, and the work bears no marks of haste; it is more probable that it had been long the work of his leisure, and was certainly sold for him by Dr. Johnson for 60L., when in much want of money; but the bookseller was so doubtful of success, that it remained unpublished till 1766, when his fame as the author of "The Traveller" gave better hopes of its being favourably received. In December, 1764, appeared his "Traveller," for which he received twenty guineas, and of which four editions were published by the following August. In 1766-7 he wrote his first comedy, "The Good-natured Man," which, after much delay, and almost a quarrel with Goldsmith, was first produced at the Theatre Royal, Covent-Garden, probably 450L. In this year he also concluded an agreement for writing the "History of Rome," for which purpose he retired to a cottage near Cannons, by Edgeware; this work is written with great ease and clearness, but not remarkable for historical research or accuracy. In the following year he commenced his "Animated Nature," to which a similar remark may be applied: both were and continue to be popular as school-books. On the 26th of May, 1770, the first edition of the "Deserted Village" appeared, and on August 15 the fifth was issued, a satisfactory proof that good poetry is encouraged when it is produced, for certainly it bears little resemblance to the style then said to be fashionable. He now made a short excursion to Paris, of which few memorials have been left. In this year also he wrote the "Haunch of Venison." In 1771 he undertook his "History of England," during its composition he lodged at a farm-house in Hyde Lane, near Kenton, also in the vicinity of Edgeware; and here also was produced "She Stoops to Conquer," which was acted with marked success on March 15, 1772, in defiance of the forebodings of Colman, the manager, and the half-disclosed opinion of Garrick. In 1773 he translated the works of Scar-ron, and wrote his poem called "Rationalization;" and this, though he continued labouring to the end, was his last important work, he having died on the 4th of April, 1774, in consequence, it is stated, of his own imprudent treatment of his disorder, having persisted in taking ipecacuanha and James's powders, in spite of the remonstrances of his medical attendant. He was buried in the Temple Church-yard, and a simple monument, bearing Dr. Johnson's celebrated inscription, was raised to his memory in Westminster Abbey.

There are perhaps few persons of whom a more numerous or a more entertaining stock of anecdotes are narrated, but we have omitted them, as we think most of them have originated with or been related by persons not having a true understanding of him, and tending to give a false impression of what we think his real character. Boswell and his clique seem to have considered him as quite a simpleton; and even Johnson, though generally defending him from such imputations, has called him "an inspired idiot." The esteemed friend—friend in a far higher sense than that of the relation in which Boswell himself stood—of Edmund Burke, Johnson, and other eminents, could not have been the fantastic fop, the jealous disparager of merit in others, the conceited boaster, the idle and apathetic student, and the general butt of all companies, which it has pleased the world to consider him. His peach-blossom coat may have been somewhat extravagant even in an age of gayer clothing than ours; but we think less fit than his recorder. If he said that he could play Punch better than the performer, was it not rather in reference to its lowness as an art than with an intention of himself descending to its practice? He was certainly an absent man, apparently not a ready speaker, and had a deeply seated love for wit, warmth, and fun; yet no one had a more perfect knowledge of his defects and weaknesses than himself; no one knew better that

"—prudent cautious self-control
Is wisdom's root:

he has inculcated this; but his nature was genial, and his feelings impulsive; his buoyant spirits led him to extravagancies of behaviour or expression, and his sympathies to imprudences; neither led him to the verge of meanness or dishonour. In his love of mirth he cared little for the moment whether he was laughed at or with, and he preferred leaving a blunder, a misconception, or a paradox to be sported with, to either explaining or defending them. The mind of Goldsmith was by no means disputatious; those of most of his associates were: and it is remarkable how often Boswell relates his offering opinions of considerable weight (though Boswell laughs at some of them because opposed to those of Johnson), which he leaves at once to their fate, or to the voluntary support of others, frequently of Johnson himself. We can well imagine the quiet glee he enjoyed at witnessing Johnson, while arguing for victory, urging his eminence and arguments, to which, while fondly admiring the ingenuity and talent of the man, he was repeating to himself the "Pudge" of his own Burchell, and still more so in the case of many others. "Magnanimous Goldsmith" chose to be "gooseberry fool," soft, sweet, and simple. But let himself lift the curtain. Did ever "gooseberry fool" beside himself see so distinctly, and delineate so sharply, yet kindly, the characters of his friends? His portrait of Edmund Burke, in fourteen lines, contains all the truth that could be said in volumes; and of Cumberland, the dramatist,

"who made it his care
To draw men as they ought to be, not as they are,"

what can be more sarcastic? or more amiable than the apology that

"He grew lazy at last, and drew from himself?"
That of Garrick, and indeed of every individual mentioned, are equally excellent; while the allusion to himself of "I shall compile," gives a cordial finish to the whole, that is delightful. This poem, the 'Retaliation,' was not finished when he died, or we might have had in addition the picture of Johnson, and perhaps Boswell; if we could suppose that he would have treated publicly with one he revered so much, and one of whom he thought so little.

We have had many authors with more correct and extended knowledge, we have had some with a deeper insight into human nature, some with a more excursive fancy; but for kindness of feeling, truthfulness of description, purity of morals, melody of versification, and for the calm pleasure which we always feel in reading his works, he is equal to any.

VARNISHED WARE OF THE BURMESE.

There can be no doubt of the great superiority of European manufactures over those of other parts of the world; but there are still some few objects, which, through unwearyed patience and minute ingenuity, or by the help of some natural revolutions not found in Europe, the people of Asia are able to produce of a better quality than we can supply. Among these must be named the Burmese varnished or lacquered ware, of which several specimens have at different times been brought to England, and are to be seen in collections of curiosities. This ware in its best state is like very fine papier-maché; it is thin, light, and so flexible, that the two sides of a cup may be pressed together so as to touch each other, without cracking the colour or at all injuring the article, which returns to its former shape as soon as the pressure is taken off. It is sometimes made of a shining black, at others of a vermillion red, like sealing-wax, but is more commonly ornamented with figures of yellow or green upon a red ground, or red upon a black ground; and some very superior articles are decorated with raised figures of gold. This ware is used for all the economic purposes that earthenware serves with us, and for others to which the brittleness of our ware prevents us from applying it; it is made into cups, dishes, boxes, trays, baskets, buckets, and a variety of other objects.

The process of making this ware has been minutely described by Major Burney, who witnessed every branch of the manufacture at Amarapura; and the museum of the Asiatic Society in London contains several specimens of various kinds, as well as a set of cups in every stage, from the first weaving of a few strips of bamboo, to the complete formation of an elegant article of domestic economy. A description of each specimen will best explain the whole process.

1. The first is a wooden form or mould, covered with

strips of bamboo woven together so as to form a basket, which is the frame-work of the intended cup; the weaving is like that of ladies' work-baskets, and care is taken that it shall be as thin and light as possible, as upon this matter the beauty and delicacy of the ware will depend; towards the edges the weaving is of a closer nature, and the bamboo is made as fine as hair.

2. In the second specimen the basket is covered on the outside with varnish, laid on with a brush made of the husk of the cocoa-nut. This varnish is the essential part of the manufacture, without which nothing can be done; it is named thit-tsi (wood-oil), and is procured from a tree of which there are extensive forests in the northern parts of the Burmese empire. A small hole from the tree holes are pierced in the trunk, and little slips of bamboo inserted to convey the oil to vessels placed beneath. The tree is described as being very large and beautiful, and in the flowering season to be so covered with blossoms as entirely to conceal the leaves, showing only one mass of white; the flower has a fragrant scent resembling that of apples, and the young buds are eaten by the Burmese in curries. The varnish may be gathered at all times, but if taken during the flowering season, which is at the beginning of the year, it does not harden well. It appears to be in many of its properties analogous to Chinese varnish, and it affects in a similar way the wealth of those who prepare it; not, apparently, to such a degree as in China, but still enough to be very unpleasant to those unaccustomed to it, who frequently find their hands blistered and their arms and faces swelled from its effects; all who use it take certain precautions against accidentally swallowing any portion, and they are careful to touch it with the right hand only, while they take their food with the left. Some persons are more seriously effected by the varnish than others, and its injurious effects appear in blotches so much resembling leprosy, that the other Burmese refuse to hold intercourse with the affected person. It would seem from the following rhyming proverb that they connect moral defect with this liability:-

Thit-tsi thēk-thei,  
Lu ma-then phyet-thēi,  
Lu then atwa ma shē.  

i.e. "Thit-tsi is a true witness; it injures the false man, but does no harm to the true."

The varnish, as before remarked, is laid on with a brush, to spare the hand as far as practicable, but in all future operations on the same vessel it is laid on with the hand, both in order to procure a fine surface and to enable the workman to discover and reject the minutest particles of dust. When first laid on, the varnish looks of a light brown colour, but rubbing with the hand turns it to a fine black. When the cup is varnished, it must be carefully shut up in a box to exclude the dust, and then deposited in a deep cold vault, which is said to be essential to its proper setting, and with which every manufactury is provided. The cup is kept in the vault at least a month.

3. The third cup is advanced another step towards completion; it is covered over with a thick black paste, which is intended to stop up all holes in the basket and to give the ware a body. Different pastes are used for this purpose, but all agree in being composed of some fine powder, mixed up with thit-tsi: in one sort, the powder is that of calcium, mixed; in another, it is the husk of rice, carbonised; and in another, the fine saw-dust of teak-wood: in all cases the paste is dabbed on with the fingers, so as to hide the basket as far as the workman is able to do it. The specimen under description looks black and rough, and the basket appears in several places through the paste. After this process, as well as after every other in which the varnish is
used in any shape, the cup is returned to its concealment in the vault, where it must remain at least three days before any subsequent operation can be proceeded with.

4. The next specimen is the cup ground smooth within side. This operation is performed in a clumsy lathe, one of which is in the Asiatic Society's museum:

5. The fifth cup has undergone precisely the same operation on the outside, the only difference in the manipulation being that the cup was fastened upon a form or chuck, so as to leave the outside open to the workman, instead of being put into a basket to expose the inside. This cup is covered on the inside with an additional quantity of paste of finer quality, which was laid on by the workman after the outside was ground smooth and dried, in order that it might receive an additional polish on a subsequent day.

6. This specimen is covered with fine paste on the outside as well as on the inside. Its appearance is rough and black.

7. In this stage the cup has been ground outside and in, and has also received a coat of fine varnish. This is the result of two successive operations, with the interval of at least three days between them: the grinding is performed on the lathe, as in Nos. 4 and 5; but instead of pumice-stone, the workman employs first a piece of smooth sandstone, then a rag with charcoal and water, and lastly, a piece of moist cloth. The cup is dried well in the sun before the varnish is laid on, which is done with the finger.

8. This cup has received a second coat of varnish, and is quite black and glossy, but not even on the surface.

9. The next cup is simply polished in the lathe: this is performed by turning first against a piece of smooth sandstone, as in No. 7; then by moistened rice-husks, held in the hollow of the left hand against the cup while turning; thirdly, by a rag dipped in well-pulverised teak-wood; and lastly, by the hand smeared with a peculiar polishing-powder, said to be made of the petrified wood of a tree called Engygen. The ware thus finished is like the black japanned ware used in this country.

10. The ware in this specimen is red, like sealing-wax; not so fine as our red japanned ware, but still clear and bright. The colour is manufactured at Ava, and is said to be superior to the best Chinese vermillion: it is moistened with an oil called shan-zi, extracted from the kunyen-tree (Dipterocarpus turbinatus), and then mixed with thit-tsi varnish. The mixture is laid upon the cup after it has gone through the two first operations of No. 9, and nothing more is required than giving it a polish with the hand, unless extraordinary lustre is desired, when a mixture of shan-zi and thit-tsi is applied.

Specimens 11 and 12 are engraved cups, execute in the Shan or Siamese style. The engraving is done with great ingenuity and rapidity, although the only tool is a needle, tied to a stick, and whetted on a bit of slate. The artist holds the cup on his knees with his left hand, and keeps his graver almost motionless in his right: he then dexterously turns the cup by the help of his knees to meet the graver. The Shan style consists in engraving a piece of black ware, as No. 9, and filling up the hollows with vermillion: if any figures are represented, they are left in relief, in the manner of wood-engraving. Some grotesque figures done in this way are seen in No. 12. In specimen No. 11 the hollows are not yet filled in, and the cup has a greyish appearance, arising from the light brown lines left by the graver in the polished black varnish. The vermillion is laid on as in No. 10, and, after drying several days, is rubbed off in the lathe with wet bran held in the hollow of the hand. The operation is generally repeated, to ensure a complete filling up of all hollows, and the cup is afterwards varnished and polished.

A more expeditious mode, called the Burman style, consists in engraving upon a red cup, left as in No. 10, and filling up the hollows with different colours, usually yellow or green. Specimen 13 is engraved with grotesque Chinese-looking figures; and 14 is a similar one with the lines filled with yellow orpiment. The engraving is first prepared by being varnished over; the colour is immediately rubbed in with the finger until it is quite dry, when the cup is finished. Sometimes a small quantity of indigo is mixed with the orpiment, which produces a green colour. Several articles in the Society's museum are very finely executed in this way, some of which have both figures in the same specimen. The beauty of the engraving consists chiefly in the contrast of bright colours and the regular interlacing of minute lines, in which some specimens re-
several sheets of paper, each printed separately from neither bite on the side of the bill nor picking up anything the others, and all joined edge to edge; the types, like before it, nor pecking forwards, its bill being composed of parts of metal and parts of wood. The use of wood types (or stereotype plates cast therefrom) such as are used for posters, but the cutting of large posting-bills and placards, presents a feature something different, and worthy of a brief notice.

Theatrical announcements, newspaper placards, coach-office posting-bills, and other kinds of advertisements frequently consigned to the hands of the 'bill-sticker,' often present surfaces of very large dimensions, and specimens of type greatly exceeding in size any used for printing books. Such bills consist of several sheets of paper, each printed separately from the others, and all joined edge to edge; the types, likewise, instead of being formed wholly of metal, are partly of metal and partly of wood. The use of wood-type letters deserves a few remarks.

In the printing of large posting-bills, the small letters are common metal types, but the larger letters, as well as the pictorial embellishments which may form part of the bill, are cut in separate blocks of wood, and afterwards adjusted to the smaller metal types. All metal types are made exactly to one height (about seven eighths of an inch) so that when ranged side by side their ends may present a perfect level; and for a similar reason the wooden letters are made of a similar height. The wood preferred for these letters is that of the apple-tree, being inodorous and close-grained; but pine is more frequently used for the larger sizes. The planks of wood are sawn and planed to the proper thickness; and after the forms of the letters have been marked on the surface by a gauge or pattern, the wood is cut away at the boundary-lines. The cutting is carried quite through the thickness of the wood, so as to constitute it a distinct piece of wood; but the interior vacancies of a letter, such as those in the O, the G, the A, &c., are cut away only to a depth of about a quarter of an inch, sufficient to keep clear of the ink with which the surface is afterwards covered, and at the same time avoiding the weakening effect of cutting the wood entirely through. Everyone must have observed that the large posting-bills which our streets present, black or coloured letters are generally seen on a white ground, or on a ground of a different colour from that of the letter; occasionally, however, the letter is white on a coloured ground. In this latter case the block, instead of being cut away within and around the letter, is partially or wholly worked out within the surface of the bill. To leave the letter itself projecting, is cut away in the part which is actually to form the letter; so that the ink entirely escapes the letter itself. The cutting is effected by chisels and gouges of the usual kinds, and is the work of a class of artisans called 'Wood letter Cutters,' or 'Wood-type Cutters.'

In the printing of large posting-bills, the small types are generally seen on a white ground, whilst the name Scissor-bill has been intended to point out the manner in which the two unequal mandibles of its bill fall one upon the other; of these, the lower, hollowed into
a gutter with two elevated trenchant edges, receives the upper, which is fashioned like a blade (lame)."

Now the structure is the very reverse. The upper mandible at its base overlaps the lower with its edges; but the upper edge of the under mandible, which consists of a thin flattened plate or blade, is received in a groove with elevated sharp edges on the lower surface of the upper mandible: this groove diverges at the base, and thus comes to overlap the lower at the gape as above noticed. We shall presently see how effectually this apparently uncouth instrument is adapted to the necessities of the animal. Catesby indeed justly speaks of it as 'a wonderful work of nature,' and accurately describes it. 'The under mandible,' says he, 'is more compressed than the upper, and very thin, both edges being as sharp as a knife, and is almost an inch longer than the upper mandible, which has a narrow groove or channel into which the upper edge of the lower mandible shuts.' Yet Buffon, who quotes Catesby, gives the erroneous description above noticed.

The male is about nineteen inches in length; the closed wings extend beyond the tail four inches; expanded wings forty-four inches. Length of the lower mandible four inches and a half; of the upper, three inches and a half; both red, tinged with orange, and tipped with black. Upper part of the head, neck, back, and scapulars, black; wings the same, except the secondaries, which are white on their inner vanes, and also tipped with white. Tail forked, the two middle feathers about eight inches, the rest five; of the upper mandible, which has a narrow groove or channel into which the upper edge of the under mandible is received, a vast expansion of wing is given, the beak only allotted, is of uncommon hardness, strength, and muscularity, far surpassing in these respects any other water-bird with which I am acquainted. To all these is added a vast expansion of wing, to enable the bird to sail with sufficient celerity while dipping in the water. The general proportion of the wing of our swiftest hawks and owls is, however, about two to two; but in the present case, as there is not only the resistance of the air, but also that of the water to overcome, a still greater volume of wing is given, the sheerwater measuring nineteen inches in length, and upwards of forty-four in extent. In short, whoever has attentively examined this curious apparatus, and observed the possessor, with his bewitching neck, and lower mandible occasionally dipped into and ploughing the surface, and the facility with which he procures his food, cannot but consider it a mere playful amusement, when compared with the dashing immersions of the tern, the gull, or the fish-hawk, who to the superficial observer appear so superiorly accommodated. The sheerwater is most frequently seen skimming close along shore, about the first of the flood. I have observed eight or ten in company passing and repassing at high water, dipping with extended neck their open bills into the water with as much apparent ease as swallows clean up their feathers. And this is the 'suspecteable' of M. Buffon, to which he tells us the bird is condemned on account of its 'organe defectueux.'

Mr. Darwin says, "I saw this bird both on the cast and west coast of South America, between latitudes 30° and 45°. It frequents either fresh or salt water. Near Maldonado, in May, on the borders of a lake which had been nearly drained, the birds, which sequence swarmed with small fry, I watched many of these birds flying backwards and forwards for hours together close to its surface. They kept their bills wide open, and with the lower mandible half buried in the water. Thus skimming the surface, generally in small flocks, they ploughed it in their course; the water was quite smooth, and it afforded a curious spectacle to behold a flock, each bird leaving its narrow wake on the mirror-like surface. In their flight they often twisted about with extreme rapidity, and so dexterously managed, that they ploughed up small fish with their projecting lower mandibles, and secured them with the upper edges of their mandibles, and swallowed them. This fact I repeatedly witnessed, as like swallows they continued to fly backwards and forwards close before me. Occasionally when leaving the surface of the water, their flight was wild, irregular, and rapid; they then also uttered loud harsh cries. When these birds were seen fishing, it was obvious that the length of their priory feathers was quite necessary in order to keep their wings dry. When thus employed their forms resembled the symbol by which many artists represent marine birds. The tail is much used in steering their irregular course."

"These birds are common far inland along the course of the Rio Parana; and it is said they remain there during the whole year, and that they breed in the marshes. During the day they rest in flocks on the grassy plains, at some distance from the water. Being at anchor in a small vessel in one of the deep creeks between the islands in the Parana, as the evening drew to a close one of these scissor-beaks suddenly appeared. The water was quite calm, and the birds were fishing. The bird continued for a long time to skim the surface, flying in its wild and irregular manner up and down the narrow canal, now dark with the growing night and the shadows of the overhanging trees. At Monte Video, I observed that large flocks remained during the day on the mud-banks at the head of the harbour, in the same manner as those which
I observed on the grassy plains near the Parana. Every evening they took flight in a straight line seaward. From these facts I suspect that the Rhynchops frequently flies by night, at which time many of the long-beaked Rhynchops, comparatively with that of the duck, is not what you anticipated. The facial or sensitive branches of the fifth pair of nerves are very small; the third division in particular is filamentary, and have not been able to trace it beyond the soft integuments at the angles of the mouth. After removing with care the thin horny covering of the beak, I cannot perceive any trace of those nervous expansions which are so remarkable in the lamellirostral aquatic birds, and which in them supply the tooth-like process and soft marginal covering of the mandibles.' Nevertheless, when we remember how sensitive a hair is through the nerve situated at its base, though without it in its substance, it would not be safe to deny altogether a sensitive faculty in the beak of the Rhynchops." (Zoology of the Voyage of H. M. S. Beagle.)

But it appears that this organ is not merely useful as a skimmer, but that it is equally available as an oysterknife. M. Lesson says—"Though the Bec-en-ciseaux seems not favoured in the form of the beak, we had proof that it knew how to use it with advantage and with the greatest address. The sandy beaches of Penco are in fact filled with Mactra, bivalve shells, which the ebbing tide leaves nearly dry in small pools; the Bec-en-ciseaux, well aware of this phenomenon, places itself near these mollusks, waits till their valves are opened a little, and profits immediately by the occasion to plunge the lower and trenchant blade of its bill between the valves, which immediately close. The bird then lifts the shell, beats it on the beach, and cuts the ligament of the mollusk, which it then swallows without obstacle. Many times have we been witnesses of this highly perfected instinct." (Manuel d'Ornithologie.)

Mr. Nuttall states that the Cut-water, or Black Skimmer, is a bird of passage in the United States, appearing in New Jersey (to the north of the sea-coast of which it believes, it is unknown) from its tropical quarters early in May; and he thinks that it probably passes the breeding season along the whole of the southern coast of the United States. In New Jersey it resides and breeds in its favourite haunts, along the low sand-bars and dry flats of the strand in the immediate vicinity of the ocean. Their nests have been found along the shores of Cape May about the beginning of June, and consist of a mere hollow scratched out in the sand, without the addition of any extraneous materials. The eggs are usually three in number, oval, about one inch and three-quarters to two inches by one inch and a quarter, and nearly pure white, marked almost all over with large umber-brown blotches and dashes of two shades, and other faint ones appearing beneath the surface. In some eggs these particular blotches are from half an inch to an inch in length. As the birds, like the terns and gulls, to which they are allied, are gregarious, the female only sits on her nest during the night, or in wet and stormy weather; but the young remain for several weeks before they acquire the full use of their wings, and are during that period assiduously fed by both parents: at first they are scarcely distinguishable from the sand by the similarity of their colour, and during this period may often be seen basking in the sun, and spreading out their wings upon the warm beach. The pair, retiring to the south in September, or as soon as their young are prepared for their voyage, raise but a single brood in the season." (Manual of the Ornithology of the United States and of Canada, vol. ii.)

The same author states that this species is met with in the equatorial regions of America, where it is resident as far as Surinam, but never penetrates into the interior, being, properly speaking, an oceanic genus.

M. Lesson remarks that, though this bird closely approaches the species belonging to the Antilles, it is still possible that it may be distinct from it.
SOUTHERN ABORIGINES OF SOUTH AMERICA.

Of the most southern aborigines on the globe, inhabiting Patagonia and Tierra del Fuego, we are perhaps best acquainted with the Patagonians, though our knowledge of them is less perfect than might be expected. The name of Tierra del Fuego, given by Magalhaens because many fires were seen in the night upon that land, is applied to all the islands south of Magalhaen's Straits, from 52° 30' to 56° south latitude, including Staten Land and the islets of Diego Ramirez. The extent of land comprised within these limits probably exceeds the area of Great Britain. This archipelago is a region of clouds, vapours, rain and storms, but the temperature is more uniform than could be expected in so high a latitude. During the summer nights the thermometer frequently sinks to 29°, but even when still lower the cold is not disagreeable, as would be the case in our own climate. Plants which in England require to be delicately nurtured flourish during the winter, and the parrot and the humming-bird may be seen even amid the falling snow. In winter the temperature of the sea is 30° higher than on the adjoining land, and the constant evaporation from the surface of the ocean neutralises the low temperature of the coast. The sides of the mountains are barren towards the sea, but towards the mainland are thickly wooded. Still Tierra del Fuego is one of the most disagreeable countries in the globe.

Captain Fitzroy, who was employed, a few years ago in surveying these coasts, divides the Fuegians into six tribes, the whole comprising rather more than three thousand adults. The Yacanas are the most numerous, the number of adults belonging to this tribe being about six hundred. They resemble the Patagonians, and Captain Fitzroy conjectures that they are probably in the same condition in which the Patagonians were before they had horses. The Tekeenicas, who number about five hundred adults, exhibit some of the worst and most melancholy features of savage life. The Alikhoolip tribe, which reckons four hundred adults, are superior to the Tekeenicas, but inferior to the Yacanas. The men, however, are the most robust, and the women the least ill-favoured of any of the Fuegian tribes. The Pecherays, numbering two hundred adults, are the most miserable of these tribes. Captain Fitzroy supposes the Huemul tribe, which only reckons about two hundred adults, to be a branch of the Yacanas. The Chonos tribe consists of about four hundred adults, inhabiting Western Patagonia. The Patagonians are physically and mentally superior to the Fuegians. They have subjugated the horse to their use, and hence are often termed Horse Indians. The tribes to which we shall at present confine our attention are all natives of Tierra del Fuego, with the exception of the Chonos; but as this latter tribe is more nearly allied by its leading customs to the Fuegian tribes, and is like them contradistinguished from the Patagonians by not having subjected the horse, they may be treated in a group, to which the name of Canoe Indians is given. Each of the Fuegian tribes speaks a distinct language, but some words are common to two or more tribes.

Captain Fitzroy, who is perhaps better acquainted with the natives of Tierra del Fuego than any other man, and, as we shall afterwards show, has made greater exertions than any other man to raise them in the scale of civilisation, has sketched their personal appearance and character in his interesting 'Narrative of the Voyages of the Adventure and the Beagle.' We cannot do better than give an extract from his description in his own words:—'The most remarkable traits in the countenance of a Fuegian are his extremely
small low forehead; its prominent brow; small eyes (suffering from smoke); wide cheek bones; wide and open nostrils; large mouth and thick lips. Their eyes are small, sunken, black, and as restless as those of savages in general. Their eyelids are made red and watery by the wood-smoke in their wigwams. The chin varies much; that of a Tekemenia is smaller and less prominent than that of an Altkohoop, in whom it is large and rather projecting; but there is much variety. The nose is always narrow between the eyes, and, except in a few curious instances, is hollow in profile outline, or almost flat. The mouth is coarsely formed; their teeth are very peculiar; no canine or eye-teeth project beyond the rest, or appear more pointed than those: the front teeth are solid, and often flat-topped, like those of a horse eight years old, and enamelled only at the sides; the interior substance of each tooth is then seen as plainly, in proportion to its size, as in that of a horse. Their hair is black, coarse, and lank. It does not fall off, nor does it turn grey until they are very old. Little if any hair is seen on the eye-brows. They would appear to have a straggling beard, but scrubulously pulled out every hair with tweezers made of muscle-shells. Captain Fitzroy observed several men and women whose appearance resembled that of the New Zealanders.

"Their heads are remarkably low, but wide, and full from the ears backward. The neck of a Fuegian is short and strong. His shoulders are square, but retire more into the interior waters in search of shell in walking. The knee is strained by the press of the above, and startled." When straightened, there are considerable folds or creases of the skin, which they catch among the sea-weed (kelp)."

Mr. Darwin, the naturalist, who accompanied the surveying ships, after visiting a party of the Fuegians, says: "The party altogether closely resembled the devils which come upon the stage in such plays as Der Freischutz.... Their very attitudes were abject, and the expression of their countenances distrustful, surly, and startled."

Of the mental character, arts of life, and the manners and customs of the Fuegians, we purpose to give some account in a future number.

**DOMESTIC ECONOMY.**

**BOILING FOOD.**

Count Rumford,* a most able American writer on the philosophy of preparing food for the use of men, says, that all the fuel which is used for making water boil violently in dressing of food is absolutely wasted; and in another place he says, that the waste of fuel in culinary processes, which arises from making liquids boil unnecessarily, or where nothing more would be necessary than to keep them boiling hot, is enormous."

There is not a doubt," he adds, "that much more than half the fuel used in all the kitchens, public and private, in the whole world, is wasted precisely in this manner." But the mere waste of fuel is not the only evil attendant upon violently boiling; the meat itself is rendered tough, and otherwise materially injured. It is well known that meat may be dressed in water, which is kept boiling hot, without actually boiling, and also that it may even be cooked with a degree of heat below the boiling point.

The heat of boiling water is not the same in all situations; that it depends on the pressure of the atmosphere, and consequently on the average level of the surface of the sea than in inland countries, and on the tops of high mountains; but we never heard that any difficulty was found to attend the process of dressing food by boiling, even in the highest si...
The first thing to be ascertained is, how much fuel would be required to heat the water and the beef boiling hot; and then to see how much more would be required to keep them boiling hot three hours.

And, first, for heating the water. It has been shown by experiments that 20 lbs. of water may be heated 180° of Fahrenheit's thermometer with the heat generated in the combustion of 1 lb. of dry pine wood.

But it is required to heat the water in question only 157°; for its temperature being that of 55°, and the boiling point 212°, it is 212°−55° = 157°; and if 1 lb. of the fuel be sufficient for heating 20 lbs. of water, it must be sufficient for heating 23 lbs. of water 157°.; for 157° is 134° of the boiling point of 212°.

But if 23 lbs. of water, at the temperature of 55°, require 1 lb. of dry pine wood as fuel, to make it boil, then 300 lbs. of water (the quantity required in the process in question) would require 124 lbs. of the wood to heat it boiling hot.

To this quantity of fuel must be added that which would be required to heat the meat (100 lbs. weight) boiling hot. Now, it has been found by actual experiment, by Dr. Crawford, that the flesh of an ox requires less heat to heat it than water, in the proportion of 74 to 100; consequently the quantity of beef in question (100 lbs.) might be made boiling hot with precisely the same quantity of fuel as would be required to heat 74 lbs. of water, and 26 lbs. of water, would be sufficient to raise boiling hot.

And this quantity in the case in question, would amount to 32 lbs., as will be found on making the computation.

This quantity (32 lbs.), added to that before found, which would be required to heat the water alone (= 29 lbs.), gives 26 lbs. of dry pine wood for the quantity required to boil 300 lbs. of water and 100 lbs. of beef (both at the temperature of 55°) boiling hot.

To estimate the quantity of fuel which would be necessary to keep this water and beef boiling hot three hours, we may have recourse to the results of experiments, by which it has been proved that 30 lbs. of boiling hot water were actually kept boiling (not merely kept boiling hot), three hours with the heat generated in the combustion of four pounds and a half of dry pine-wood, this gives 338 lbs. of boiling hot water kept boiling one hour, with one pound of the fuel; and computing from these data, and supposing farther, that a pound of beef requires as much heat to keep it boiling hot any given time as a pound of water, and that the fuel required to keep 300 lbs. of water, with 100 lbs. of beef in it, boiling three hours. This quantity of fuel (= 34 lbs.) added to that required to heat the water and the meat boiling hot (= 26 lbs.), gives 29 lbs. of pine-wood, for the quantity of fuel required to cook 100 lbs. of boiled beef.

This quantity of fuel, which is just about equal in effect to 16 lbs. or three-quarters of a peck of pit-coal, will doubtless be thought a small allowance for boiling 160 lbs. of beef; but it is in fact much more than would be necessary merely for that purpose, could all the heat generated in the combustion of the fuel be applied immediately to the cooking of the meat, and to that purpose alone. Much the greatest part of that which is generated is expended in heating the water in which the meat is boiled, and as it remains in the water after the process is ended, it must be considered as lost.

This loss may, however, be prevented in a great measure; and when that is done, the expense in fuel in boiling meat will be reduced almost to nothing. We have just seen that 100 lbs. of meat, at the mean temperature of the atmosphere in England (55°), may be made boiling hot with the heat generated in the combustion of 32 lbs. of pine-wood, and there is no doubt,
with the use of proper means for confining the heat, that this meat might be kept boiling hot three hours, and consequently thoroughly done, with the addition of 2lb. of the fuel, making in all 4lbs. of pine-wood, equal in effect to about 21 lbs. of pit-coal; which, according to this estimate, is all the fuel that would be absolutely necessary for cooking 100lbs. of beef.

This quantity of fuel would cost in London less than one farthing and a half, when the ton of coals is sold at about thirty shillings. This, however, is the extreme or utmost limit of the economy of fuel, beyond which it is absolutely impossible to go. It is even impossible, for in this limit, for the containing vessel must be heated, and kept hot, as well as the meat; but very considerable advances may be made towards it as will be shown hereafter.

If we suppose the meat to be boiled in the usual manner, and that 300lbs. of cold water are heated expressly for that purpose, in that case the fuel required, amounting to 16lbs. of coal, would cost in London the two farthings (the ton reckoned as above), just 2 pence, or 12 farthings. But all this expense ought not to be placed to the account of the cooking of the meat; by adding a few pounds of barley-meal, some greens, roots, and seasoning to the water, it may be changed into a good and wholesome soup, at the same time that the meat is being cooked, for further meals or stews may be divided between the meat boiled (100lbs., and 300lbs., or 37 4 gallons of soup.

The principal design in publishing these computations is to awaken the curiosity of the reader, and fix his attention on a subject, which however low and vulgar it has hitherto generally been thought to be, is in fact, highly interesting, and deserving of some serious consideration. We wish therefore they may serve to inspire cooks with a just idea of the importance of their art, and of the intimate connection there is between the various processes in which they are daily concerned, and many of the most beautiful discoveries that have been made by experimental philosophers in the present age.

The advantage that would result from an application of the late brilliant discoveries in philosophical chemistry, and other branches of natural philosophy and mechanics, to the improvement of the art of cookery, are so evident, and so very important, that it is hoped we shall soon see some enlightened and liberal minds take up the matter in earnest, and give it a thoroughly scientific investigation.

In what art or science could improvements be made that would more powerfully contribute to increase the comforts and enjoyments of mankind? And it must not be imagined that the saving of fuel is the only or even the most important advantage that would result from these inquiries: others of still greater magnitude, respecting the manner of preparing food for the table, would probably be derived from them.

The heat of boiling water, continued for a shorter or a longer time, having been found by experience to be sufficient for cooking all those kinds of animal and vegetable substances that are commonly used as food; and that degree of heat being easily procured, and easily kept up, in all places and in all seasons, and as all the utensils used in cooking are contrived for that kind of heat, few experiments have been made to determine the effects of using other degrees of heat and other mediums for conveying it to the substances to be acted upon. The average processes of culinary practice. The philosopher's stone, that turns all metals, and even stones, into gold, and suffers not want to break into its dwelling; and the north-west passage, that brings the merchant's ship as soon to him as he can desire. In a word, it conquers all enemies, and makes fortune itself pay contribution. - Thomson.

**Tenacity of Life in Tench.**—A piece of water which had been ordered to be filled up, and into which wood and rubbish had been thrown for years, was directed to be cleared out. Persons were accordingly employed; and, almost choked up by weeds and mud, so little water remained that no person expected to see any fish except a few eels, yet nearly two hundred brace of tench of all sizes, and as many perch, were found. After the pond was thought to be quite free, under some roots there seemed to be an animal which was conjectured to be an otter; the place was accordingly employed, and on opening the vessel, the waste was found of most singular form, having literally assumed the shape of the hole, in which he had of course for many years been confined. His length from eye to fork was thirty-three inches; his circumference, almost to the tail, was twenty-seven inches; his weight eleven pounds nine ounces; and the colour was also singular, his belly being that of a char, or vermilion. This extraordinary fish, after having been inspected by many gentlemen, was carefully put into a pond; and at the time the account was written, twelve months afterwards, was alive and well. - Yarrell's History of British Fishes.
THE EEL.

There are three different species of the fresh-water eel (Muraenidae) abounding in this country—the sharp-nosed (Anguilla acutirostris), the broad-nosed (Anguilla latirostris), and the snig (Anguilla mediorostris). A fourth has been found in some countries; but so very rarely in England, that it is not even mentioned by many naturalists. There is so much similarity between these species, that they were confounded together until within the last few years. The existence of four was first spoken of in the second edition of the "Règne Animal," in 1828. Mr. Yarrell, in his interesting work 'On British Fishes,' gives the following description of the appearance of the sharp-nosed eel:

"The head is compressed, the top convex, depressed as it slopes forward; the eyes small, placed immediately over the angles of the mouth; irides reddish-yellow; the jaws very narrow, slightly rounded at the end; the lower jaw the largest: nostrils with two openings on each side, one tubular, the other a simple orifice; both jaws furnished with a narrow band of small teeth; gape small; various mucous pores about the mouth and other parts of the head; gill-opening a small aperture immediately before and rather below the origin of the pectoral fin; the scales on the body rather small; dorsal fin extending over more than two-thirds of the whole length; both united at the end, forming a tail; the number of rays in the fins not easily ascertained, from the thickness of the skin; the lateral line exhibits a long series of mucous orifices; vertebrae 113." The differences between the three species are very slight, being principally in the form of the vertebra. The snig partakes of the appearances of both the broad-nosed and sharp-nosed. The fresh-water eel is in general about twenty or twenty-two inches in length; they grow very slowly, being seldom more than twelve inches long the first year. The sharp-nosed species attains the greatest size of the fresh-water kind; but the marine species are often five or six feet in length, and some have occasionally been caught above ten feet long. Much prejudice has existed in some countries, and does even to this day, against the eel, on account of the resemblance in its form to the serpent; but Mr. Yarrell says: "There is but little similarity in the snake and the eel, except in the external form of the body: the internal organs of the two animals, and the character of the skeleton, are most decidedly different." The eel is very much esteemed for food, and vast quantities are consumed in most countries. The Neapolitans have a custom of eating them at Christmas, and in fact they consider them as necessary as the Englishman does his roast beef and plum-pudding. Mr. Yarrell informs us that eels are not only numerous, but are also in great request in many other countries. Ellis, in his 'Polynesian Researches,' vol. ii., p. 286, says: "In Otaheite eels are great favourites, and are tamed and fed until they attain an enormous size. These pets are kept in large holes, two or three feet deep, partially filled with water. On the sides of these pits they generally remained, excepting when called by the person who fed them. I have been several times with the young chief, when he has sat down by the side of the hole, and, by giving a shrill sort of whistle, has brought out an enormous eel, which has moved about the surface of the water, and eaten with confidence out of its master's hand." Eels are caught in the Thames in wicker baskets, which are attached to a framework of wood and placed in the river. The basket is so constructed that the fish cannot possibly escape when once within the mouth of the basket. Although many are caught...
in this manner, London is chiefly supplied from Holland; and a considerable trade is carried on between the Dutch fishermen and the London markets. Eels are not known to die and generally believed that they have a great dislike to cold: they migrate in the autumn down the rivers to reach the warm brackish water, which is of a higher temperature than either the fresh water of the river or the unmixed salt of the sea. They bury themselves deep in the mud on the banks of rivers during the severe weather, and great numbers are then taken by eel-spears when the tide recedes. Eels have been known to quit the water and travel some distance during the night, either in search of food or to reach some other stream. A curious instance of this is given by Dr. Hastings, in his "Illustrations of the Natural History of Worcestershire":—A relative of the late Mr. Perrott was out shooting at Sandford in 1834 or 1835. Near his keeper near a large piece of water, on a very beautiful evening, when the keeper drew his attention to a fine eel quietly ascending the bank of the pool, and with an undulating motion making its way through the long grass; on further observation he perceived a considerable number of eels quietly proceeding to a range of stews, near the distance from the largest stone to some three feet below the surface. The eels were supplied by a rapid brook, and in all probability the instinct of the fish led them in that direction as a means of finding their way to some large river, from whence their ultimate destination, the sea, might be obtained. This circumstance took place at Sandford Park, near Enstone.

Mr. Yarrell tells us that "the eel is a voracious feeder during certain months of the year. In winter the stomachs of those which I examined were empty; by the middle of March I found the stomachs of others distended with the larvæ of many insects and the bones of small fishes. They are known to consume a large quantity of spawn, and will attack large carp, swimming through them without the power of doing them further injury. Occasionally they eat vegetable substances, and have been seen swimming about the surface of water, cropping the leaves of small aquatic plants. By means of a long and capacious air-bladder, eels rise to various elevations in the water with great ease, and sometimes swim very high in day. During my residence in the Thames, I once caught an eel in the net in two or three feet of water, though the whitebait net does not dip more than about three feet below the surface." The eel is capable of enduring very extreme cold; after having been frozen for three or four days, they have been known to recover by being put into water and thus gradually thaw.

It is supposed that after having migrated down the river, the eel deposits its spawn early in the spring, and that the parent fish seldom returns up the river; but says Mr. Yarrell, "the great bulk of their young, however, certainly ascend the stream of the river, and their annual appearance in certain places is looked for with some interest. The passage of young eels up the Thames began to be suspected of having taken place on the 9th 30th of April, and lasted till the 4th of May; but I believe I am correct in stating that few young eels were observed to pass up the Thames either in the year 1834 or 1835. Some notion may be formed of the quantity of young eels, each about three inches long, that pass up the Thames in the spring, and in other rivers the beginning of summer, from the calculated instance that it was calculated by two observers of the progress of the young eels at Kingston in 1832, that from sixteen to eighteen hundred passed a given point in the space of one minute of time. This passage of young eels is called eel-fare on the banks of the Thames,—the Saxon word signifying to go, to pass, to travel; and I have very little doubt that the term eel-fare, in common use on the banks of the Severn for a young eel, is a modification of it. The author of the article Murænidæ in the 'Penny Cyclopaedia,' speaking of the ascent of the young fry up the stream, says: "Such a desire do the young eels (about three inches length) appear to have to go up the stream, that their course is not easily stopped. The writer of this has seen a flood-gate, six or seven feet in height, in parts covered with them, and has observed many succeed in passing over this perpendicular barrier by availing themselves of the trickling water which escaped through the crevices of the wood-work." The eel is an exceedingly prolific fish, remarkably tenacious of life, and very easily preserved. Besides inhabiting the rivers of this country, they are found in most ponds and lakes. The marine species, of which the conger is the largest and commonest, are more numerous than the fresh-water.

TRIAL BY ORDEAL.

The trial by ordeal forms an interesting subject for consideration, in consequence of its having entered so largely into the systems of jurisprudence of our Saxon and Norman ancestors, and thus giving rise to some forms of speech and customs existing even to the present day. Its employment has not, however, been confined to this country, for, on the contrary, during the middle ages, it was in use in most parts of Europe, and traces of its existence have been observed in countries very dissimilar from each other in point of geographical position, manners, and customs. The general prevalence of what seems to us now so absurd an institution arose from the leading principle of the ordeal (as one of its synonyms, "judgment of God," denotes) depending upon a supposed special divine interposition being induced by its operation. In the transition and imperfect state of society in the ages and countries to which we are alluding, the substantiation of truth and the obtaining justice by human testimony and agency were often found matters of difficulty or even impossibility; and the feeble and unprotected, writhing under the grasp of the wealthy and powerful, gladly availed themselves of a means which at least we might possess the reputation of conveying the infallible decision of God himself as to the guilt or innocence of the party subjected to it. The belief in this interposition once established, this form of trial would naturally become extended, on account of the apparent certainty of the result produced by it, to all varieties of cases and every class of persons. Although not originally devised to make the priesthood, perceiving in it a powerful engine of emolument and influence, soon seized upon the trial by ordeal, converted it into a completely religious ceremony, and invariably superintended its administration. The clergy may have also thought themselves as sanctioned in upholding it by the fifth chapter of the Book of Numbers, in which verses 37—38, which escaped through the crevices of the wood-work."
traces of this form of trial. "The earliest instance of the judgments of God among the northern nations," says M. Dinaux, "was probably furnished by the ignorance of the Cloch Celts, who, when doubtful of the chastity of his wife, consigned the new-born infant, placed upon his shield, to the mercy of the waves, implicitly believing that if legitimate it would be preserved from destruction. The Salic laws introduced by the Franks admit other descriptions of ordeal, and especially that of boiling water." Gibbon, speaking of the general character of Germans and Franks, expresses himself as follows:—

"The civil and military professions, which had been separated by Constantine, were again united by the barbarians. The harsh sound of the Teutonic appellations was mollified into the Latin titles of duke, of count, or of prefect; and the same officer assumed, and frequently perjured, the engagement of both the administration of justice. But the fierce and illiterate chieftain was seldom qualified to discharge the duties of a judge, which require all the faculties of a philosophic mind, laboriously cultivated by experience and study; and his rude ignorance was compelled to embrace some simple and visible methods of ascertaining the cause of justice. In every religion, the Deity has been invoked to confirm the truth, or to punish the falsehood, of human testimony; but this powerful instrument was misapplied and abused by the simplicity of the German legislators. The party accused might justify his innocence by producing before the tribunal a number of friendly witnesses, who solemnly declared their belief or assurance that he was not guilty. According to the weight of the charge, the legal number of these compurgators was multiplied: seventy-two voices were required to absolve an incendiary or an assassin; and when the chastity of a queen of France was suspected, three hundred gallant nobles swore, without any hesitation, that her infant had been born in lawful wedlock.

In one of these extraordinary trials according to the degree of the crime, the water was to be used capriciously contrived, that in some cases guilt, and innocence in others, could not be proved without the interposition of a miracle. Such miracles were not always observed by the people, the need of water being less pressing than in the cases of burning. Such decapitate causes were determined by this easy and infallible method; and the turbulent barbarians, who might have disdained the sentence of the magistrate, subserviently acquiesced in the judgment of God."

This statement, that the ordeal was substituted for the trial by compurgation, in consequence of the defect and abuse of the latter, is not strictly correct; for, in point of fact, the two co-existed, and were frequently employed simultaneously. The ordeal was indeed frequently had recourse to, in consequence of the accused not being able to procure compurgators. Compurgators did not come forward as witnesses in defence of the particular accusation, but rather as witnesses of the general character of the culprit, from the tenor of which they believed him incapable of the crime charged against him. Compurgators also appeared on the part of the accuser, declaring that they did not believe him capable of preferring the change from motives of envy and hatred. A "villain" was obliged to procure the testimony of his lord as to his prior good character, or procure an additional number of compurgators, and submit to a trouble instead of a single ordeal.

Among the Saxons we find the ordeal first mentioned in the laws of Ina, and these were afterwards modified by Athelstan, Edward the Confessor, and William the Conqueror. It was had recourse to for a great variety of offences and disputes prior to the Conquest, and even after that event, although the trial by battle was then frequently substituted for it. The number of trial by ordeal were numerous, and, although they seem sometimes to have been almost indiscriminately employed, yet, usually, particular kinds were chosen, according to the rank of the accused and the nature of his crime.

We may cursorily notice the principal:—

1. Fire-ordeal.—This was usually appropriated to persons of some consideration, and was performed in different manners. In one of these an iron ball, from one to three pounds weight, after being heated in the fire, was carried in the hand for the space of nine feet; the hand was then enclosed in a bag, and sealed up. At the expiration of three days it was examined, and if found unjured, the person was declared innocent. In other instances live coals were to be carried in the garments without burning them; a ring of iron was passed through the hand; or a person was expected to pass through a burning pile unscathed. A more innocent ordeal was applied to books of doubtful tenets, when, if orthodox, their destruction by the flames was considered impossible. Eadmer tells us, that no less than fifty persons were at one time subjected to the fire-ordeal, in the reign of Henry the Second, on suspicion of infracting the forest laws. Theodore Lascaris, in the Eastern empire, employed the same means to detect those whom he suspected of contriving magic against him.

2. Water-ordeal.—This was either by boiling water or cold water. The ordeal of boiling water was especially, but not exclusively, employed for the detection of adultery. A ring or piece of metal, which had been blessed, having been thrown into a cauldron of boiling water, the accused thrust in the hand and pulled it out; according to the degree of the crime, the water was to reach as high as the wrist, or elbow, or even beyond this last. In three days the part was examined. In the ordeal by cold water, which was employed for the comparison of hags with each other, the hand was plunged into the pool, and bound hand and foot. The priest then adjured the water, if he were innocent, to receive him into its bosom; but, if he were guilty, to reject him. He was then cast in, and if he floated, he was declared guilty; but if he sank, he was at once drawn out by means of a cord attached to his waist. This is the origin of the custom of floating where the principle prevailed until comparatively a recent epoch. ('Penny Magazine,' vol. x., p. 111.) The permission of the use of the water-ordeal in the church is usually attributed to Eugenius II. It was abrogated in 829, but afterwards revived, and very generally practised in the tenth, eleventh, and twelfth centuries. Grotius gives many instances of its use in Bithynia, Sardinia, &c. In this form of ordeal it was expected that a miracle would be worked to discover guilt; while in the ordeals of fire and hot water the miracle would have for its object to protect innocence.

3. Ordeal of the Eucharist.—This was usually confined to monks and priests. They took the sacrament solemnly attesting the innocence of their intercession, and believed that a guilty person would be at once smitten with death or illness. On other occasions the person was led to the altar, and made a most solemn oath of his innocence upon the Gospels and sacred relics. By the laws of Childerbert twelve compurgators were admitted to swear with him.
4. Ordeal of the Cross.—This was performed differently, according as it was applied to civil or criminal procedures. In the former, the plaintiff and defendant each chose a priest as his representative. These champions remained, during the period of divine service, with their arms outstretched, so as to form the figure of a cross, and whichever priest could endure this painful posture longest, his client gained his cause. In penal cases, the accused placed a stick, upon one of which the mark of the cross was made, were hidden amidst fine wool upon the altar. One was drawn out by the priest, and if it proved the one marked with the cross, the person was declared innocent.

5. The Corsned, or consecrated morsel of bread or cheese, was a favourite ordeal with the priests for their souls' ease. The accused person was placed on the bier, and the suspected assainin desired to approach and touch the corpse. If blood flowed from the wounds, or the position of the body became changed, the charge of murder was considered as proven. The ordeal of the bier was in frequent use in the sixteenth century, and was even resorted to on one occasion at the commencement of the eighteenth century.

Many of these ordeals might be performed by deputy, and indeed there was almost a class of persons who hired themselves out for this purpose. But the deputy did no more than suffer the risk of bodily pain, and if he failed, the principal must take all other consequences upon himself.

Tietberge (A.D. 860), daughter of the emperor Louis the German, was opposed by his uncle Charles the Bold, submitted his pretensions to the ordeal. Ten men underwent the ordeal of hot-iron, ten of hot water, and ten of cold water, and they were all successful. With the consent of the accuser, the arm of a criminal was cut off, and gave evidence of the mark of the instrument of punishment. The accused might be ransomed for a certain sum of money, he then being content with the oath of compurgators. Persons taken in the act of murder or robbery were precluded from this application. After the morsel had been placed on the altar, and the priest had implored the angel Gabriel to stop the passage of the culprit's throat if guilty, it was given to him, and if he swallowed it easily he was acquitted.

6. Ordeal of the Bier.—This was used in cases of murder. The境内ed piece of bread was placed on the bier, and the suspected assainin desired to approach and touch the corpse. If blood flowed from the wounds, or the position of the body became changed, the charge of murder was considered as proven. The ordeal of the bier was in frequent use in the sixteenth century, and was even resorted to on one occasion at the commencement of the eighteenth century.

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We have already observed that the clergy contrived to invest the ordeal with all the solemnity of a religious office. Ten persons delivered the exors of thership, and kept nearly fasting for three days. Prior to the ordeal, the most solemn prayers, adjurations, and hymns were employed, in the hope of extorting the truth from the accused, and preventing him from impiously braving what in those days must have been considered a personal collision with almighty power. To this end the place of trial was chosen, and indeed every method had recourse to which could be supposed capable of exciting remorse and repentance. The trials always took place either in the church or on consecrated ground, and avowedly under the immediate superintendence of the priests. They were not permitted on fast days and festivals. This exclusive administration of the ordeal was by no means a contemptible source of revenue. The various prayers, masses, and ceremonies required each their respective remunerations, while the connivance and collusion, which must have so frequently taken place, doubtless did not go unrewarded.

But we must not suppose that these observances met with the unlimited approbation of the church. The canon law from an early period declared them inven-

Gas-Lighting.—The town of Sydney was the first city in Australia, or in fact in the Asiatic world, to which this important invention of modern times has been applied.
Is the reader will ramble some fine morning to that little green oasis in the great world of London—the Temple Gardens, and glance across the river, he will see immediately opposite to him a tall, black, bulky chimney, distinguishable from those which surround it by its large dimensions, and sending up its contribution to the smoky atmosphere of the metropolis. This chimney, and the buildings with which it is connected, point out the spot to which our attention will be directed in the present paper. It is true, the buildings present few of those attractions pertaining to "river scenery," nor do they add much to the famed beauties of the "banks of the Thames;" but they furnish an indication—one among many—of the commercial features of the metropolis, which are by no means devoid of interest.

We must quit the Temple Gardens, and cross Blackfriars Bridge to the Surrey side of the water, in order to reach the spot in question. The "way to wealth" in London, is generally through some narrow, dirty, dark, and crowded street, bounded on either side by ranges of factories, warehouses, or wharfs; with wagons and porters and cranes and bales of goods meeting the eye at every few steps. A street called Upper Ground Street, leading westward from Blackfriars Road at a short distance from the river, although it may not have a distinguished character as a "way to wealth," is certainly both narrow and dirty, and leads to many large factories and warehouses, most of which are situated in a part of the line called the Commercial Road, forming the communication between Upper Ground Street and the Waterloo Bridge Road. Among these factories, on the northern side of the Commercial Road, and occupying the space between it and the river, is the one to which our attention will be here directed, viz. the Soap and Candle Factory of Messrs. B. T. and W. Hawes; these gentlemen having with great courtesy permitted us to inspect and describe the operations conducted at this establishment.

This factory occupies the site where Queen Elizabeth's Barge-House formerly stood; a building wherein the state barge appears to have been kept, and to have undergone the necessary repairs. A creek or dock of some kind or other existed, into which the state barge was brought, but of which no vestiges now remain. A narrow pathway or passage leads down on the eastern side of the factory to the water's edge, and is known as 'Old Barge-house Stairs.' In the old maps of London, the 'Old Barge-house' is indicated as existing on this spot; but about a century ago the house ceased to be named, and we then find 'Old Barge-house Stairs' indicated. After the barge-house was removed, a glass-factory was established here; but about seventy or eighty years since, the manufacture of soap was commenced at this spot.

On entering the outer gates of the factory, we...
find ourselves in an open court, with a dwelling-house immediately on the left, a range of low buildings on the right, a counting-house and offices nearly in front, and adjacent to the latter the entrance to the main buildings of the factory. In the open court are waggons and carts, laden either with the raw materials from whence soap and candles are to be made, or with the manufactured articles about to leave the premises. In the offices and counting-house we need say nothing; they contain the usual arrangements for the partners and clerks in the establishment. Contiguous to these offices is a small laboratory fitted up with a furnace, a sand-bath, a distilling apparatus, and other conveniences for conducting the chemical analysis of soap, and for making experiments incidental to the manufacture.

The manufacture of soap is conducted in the warehouses westward and northward of the offices; the candle office is in one place a man filling a frame with liquid soap; in another, men taking a frame to pieces after the solidifying of the soap; in a third, other men cutting up a mass of hardened soap into slabs.

Near the frame-room is a range of ware rooms, in which the slabs of soap brought up in tiers are piled up in tiers, like bricks in a wall. If "cleanliness is next to godliness," according to the old adage, we ought to have very pleasant thoughts while passing between these walls of soap—here 'mottled'—there 'yellow'—in another part 'curd,' and so on; but the truth is, that the odour from such a mass of soap, and the unavoidable absence of currents of air, distorts all the sense of smell; a fact that disturbs the pleasure of contemplating the exterior purpose to which the soap is to be applied.

In other parts of the factory, according to convenience, are placed the boiler-house for soft soap, and warehouses connected with it. The soft-soap copper is heated and managed in the same manner as the copper for the hard soaps, and the oil is melted out of the cask through the bung-hole by means of steam. In another part, the oil thus melted is purified and bleached, and brought into a state fit for the soap-manufacture. Other rooms, or portions of rooms, are devoted to various subsidiary processes relating to the soap-manufacture; but to which we need not pay particular notice.

After having visited the various parts of the soap department, we glanced through the candle-department, which, although much less considerable in size, presents many ingenious arrangements and many curious applications of the division of labour. The principal room in this department is that in which the 'dipping-room.' This is, to the eye of a stranger, the most singular-looking room in the factory. It is of considerable height, having two stories
or floors, one extending over the bottom in the usual way, and the other forming a kind of gallery round the four sides, at the height of about twelve feet from the floor. An inclined plane leads down from the gallery at one end to the floor at the other, consisting of a platform with ledges of wood at distances of about a foot asunder, forming a kind of an apology for a flight of stairs; it is, indeed, a kind of staircase, such as is used by ship-builders to ascend the sides of a ship, and is duty collected to which we here refer; this is another the ascent of person carrying loads. The floor, or ground of the room is devoted to the manufacture of the cisterns, filled with tallow in a hot and melted state, which is kept at a proper temperature. Along the middle of the floor is a row of cisterns, filled with tallow in a hot and melted state, which is kept at a proper temperature. Around the room on all four sides, and distant a few feet from the cisterns, are reservoirs or vessels of melted tallow, filled from the central cisterns, and contaminated in the process of making candles. Between and above are candles, or the skeletons of candles, hanging in thousands; some having had only a single garment of tallow to cover the nakedness of the wicks; some more plentifully coated; and some nearly in a finished state. On three sides of the room men are making candles by the aid of the machines which we shall speak of presently. The fair trader, engaged in these operations, is adapted by the smallness of its angle of elevation for subject: it is the mode of collection which is so objectionable, by imposing impolitic checks to the natural course of improvement in manufacturing processes. Considerable ameliorations have, within a recent period, been made in the mode of collecting the revenue, and the survey of the premises of soap manufacturers; and under the able superintendence of the present chairman of the Excise (Mr. Wood), the manufacturers feel confident that, odious as the collection of the Excise revenue must be, every facility consistent with the security of the revenue will be afforded for the introduction of improvements and the protection of the fair trader.

It is almost impossible to calculate the benefits which would result to our manufactures if the Excise could be abolished, or the amount of the tax so reduced as to remove the temptation for the commission of fraud, and the letters and offices fitted up for the Excise-officers, one or more of whom are in the factory day and night. It is a great blot upon the fiscal arrangements of this country, and one which seriously affects the manufacture of malt, of glass, of soap, and many other articles, that in order to collect the duties levied on these commodities, the officers of the Excise are empowered to control, as it were, every step of the processes, and regulate the extent to which any improvement in the operations may be carried. It is not the amount of duty collected to which we here refer; this is another subject: it is the mode of collection which is so objectionable, by imposing impolitic checks to the natural course of improvement in manufacturing processes.

The population of Great Britain is now 18,540,000. The most accurate calculations prove that the consumption of soap in the families of artizans earning from twenty to thirty shillings per week is 10 lb. per head per annum, and in families above this class from 12 lbs. to 25 lbs. per head. Now, the quantity used per head in 1840 was 61 lbs., a smaller quantity than is used in workhouses or prisons, or than is allowed to soldiers; but if half only of the population are in such circumstances as to use the quantity ascertained, by very extended inquiry, to be used by artizans, and making no allowance for the extra quantity used by the other classes, we are driven to the conclusion either that nearly one-half of our population use no soap, or that a very large quantity is made and not charged with duty. To these facts the Excise is now directed. A superior class of officers is being introduced, and it appears likely that whilst the maker will no longer be subject to unnecessary or vexatious restrictions at the caprice of an exciseman, greater security will be afforded to the revenue.
We must now return to the factory, and having noticed the arrangement of copper, boilers, engines, frames, moulds, cisterns, pumps, &c., it may be well to give such an account as the nature and object of this paper permit, of the operations conducted therein, and of the steps by which certain raw materials are converted into the known forms of soap and candles. Strictly speaking, there is a great deal of chemical nicety involved in the manufacture, both in theory and practice; but this is not the place where such matters can be consistently treated in a scientific manner. A rapid sketch of the nature and sources of the materials employed, and of their gradual transformation into the manufactured articles, will fill up the measure of this paper.

Soap is designated in the 'Penny Cyclopaedia' as a compound derived from the union between fat or oily substances and alkalis; and the nature of its formation is expressed in the following terms:—It has been proved by Chevreul that different varieties of fatty matter consist chiefly of two parts: one hard, to which he gave the name of stearin; and the other soft, which he termed olein. He also discovered that stearin is composed of stearic acid, and a peculiar principle, which, on account of its sweet taste, he named glicerin. When, in the manufacture of soap, an alkali (soda for example) is heated with tallow, the soda gradually dislodges the glicerin from combination with the stearic and oleic acids, and by combining with them, forms soap, or, in other words, a compound of stearate and olate of soda, and the glicerin remains in solution. That the manufacture of this substance from the two classes of ingredients here mentioned has been long known is sufficiently indicated by a circumstance mentioned by Mr. Parkes in his 'Chemical Essays':—"In the year 1796, a report of excavations that were made on the spot where this famous city (Pompeii) formerly stood, a complete soapboiler's shop was discovered, with soap in it, which had evidently been made by the combination of oil and an alkali. This soap was still perfect, though it had been manufactured more than one hundred years."

The curious account of this trade in a small pamphlet, printed for Nicholas Bourne, in 1641, entitled 'A Short and True Narrative concerning the Soap Business,' it contains an account of a patent granted to a Company for the exclusive manufacture of soap, under the title of the 'Governor, Assistants, and Fellows of the Society of Soapmakers of Westminster' (1637), in consideration of their paying to his majesty 4£ per ton on 5000 tons annually. The manufacturers of that day (twenty in number) refused to join and acknowledge this Company; whereupon the Company obtained a proclamation forbidding, amongst other things, the sale of soap which had not been assayed by the Company. An information was then exhibited in the Star Chamber (1639) against sixteen London makers for opposing and infringing the letters patent to which the defendants pleaded and demurred, &c., and after much discussion (all the defendants having been committed to prison for having put in their answer one day too late) the judges certified "all the answer except the first four words and last ten as fit to be expunged," and it was decreed that the defendants be imprisoned during the majesty's pleasure, and fined in various sums from 150£ to 500£. All were sent to prison. Fourteen remained there for forty weeks, and two died in prison. These tyrannical acts were followed by various proclamations and orders in council restricting the manufacture of soap except by the patentees, and putting a price on which soap should be sold, and the materials from which it should be made. In 1635 many other soapmakers were committed to prison, and greater power was given by proclamation to the patentees upon their covenanting to pay 6£ per ton on five thousands tons annually. In a short time, however, the patentees, having "vexed the whole kingdom with their soap for three years," obtained a warrant from his majesty (1637) for 40,000£ for giving up the patent, and 3000£ for their houses, and obliged the manufacturers of London to pay them 20,000£ for their materials, so that they might have use of their trade again, of which they had been deprived. Little is known of the trade from this time to 1704, when Queen Anne imposed the first Excise duty. Several pamphlets and statements, on half-sheets, are to be found in the British Museum, containing petitions to be relieved from taxes, &c., but there is no account of the quantity manufactured.

As there are many kinds of fat and oil, and two very distinct kinds of alkali employed, it naturally follows that the soap will possess different qualities, and present different appearances, according to the ingredients.

Mottled soap is made from tallow, soda, a little 'kitchen-stuff,' a minute quantity of salt, and water. Its analysis is—alkali, 63.5; grease, 62.5; water, 310; total, 100. The tallow principally employed in the soapfactories of England is brought from Russia, and is exported from thence in a solid state in barrels. So large a quantity of this substance is used in England, that about thirteen hundred thousand cwts. are imported every year, yielding to the revenue some seven hundred thousand pounds sterling. This supply is obtained principally from Russia, five-sevenths of whose exported tallow are sent to England. The tallow arrives in this country in a tolerably pure state, and requires no preparation previous to its employment in making soap. The heterogeneous substance is known to domestic servants by the name of "kitchen-stuff" or "kitchen-stuff stores" by the name of kitchen-stuff, although very impure, is capable of being cleansed and refined, and used in the same manner and for the same purposes as tallow: it is heated in a copper, strained, and otherwise freed from the extraneous substances which are mingled with the tallow. It is only in the coarser kinds of soap that this material is used.

The alkali used for mottled soap is soda, the gradual changes in the production of which form a curious episode in the history of the soap manufacture. Although the form in which the alkali is used by the manufacturer is that of caustic soda, almost or entirely free from any acids, yet the state in which it is sold to the public bears the curious name of 'brimstone.' Barilla and kelp were until lately the only sources from which this alkali was derived; the one of foreign production, and the other British. Barilla is a kind of ash obtained by burning a South-European plant called the Salsola soda, which plant is cultivated with great care by the Spaniards and Italians. A few years since there were 4000 tons imported annually from Spain, Sicily, and Sardinia; and formerly the quantity was much greater.

Kelp, another form of the carbonate of soda, alluded to above, is the ash remaining after the burning of seaweed, and was introduced into the London market for the use of the soap trade by Mr. Hawes, the father of the present firm. It contains only a little of the alkaline salt, but a large quantity of common salt, some salts of potash, and other substances. Previous to the year 1622, a duty of eleven or twelve shillings per cwt. being laid on barilla, a considerable quantity of kelp was made on the coasts of Ireland; and about a century ago it was brought into this country from Scotland, where, in consequence, the land in certain localities by the sea-shore became greatly advanced in value, very large annual revenues being derived from estates
which had previously been wholly unproductive. Dr. M'Culloch gives a graphic account of the kelp manufacture in its most flourishing state:—"The kelp season had now commenced, and the whole shore was one continued line of fires; the grey smoke streaming away from each on the surface of the water, till, mixing with the breeze, it diffused its odoriferous bane over all the surrounding atmosphere. . . . The weeds, being cut by the sickle at low-water, are brought on shore by a very simple and ingenious process. A rope of heath or birch is laid beyond them, and the ends being carried up beyond the high-water mark, the whole floats as the tide rises, and thus, by shortening the ropes, is compelled to settle above the wash of the sea, whence it is conveyed to dry land on horseback. The more quickly it is dried the better the produce; and when dried it is turned in coopers, generally constructed with stone, sometimes merely excavated in the earth. In Orkney the latter are preferred. As twenty-four tons of weed at a medium are required to form a ton of kelp, it is easy to conceive the labour employed for this quantity in the several processes of cutting, landing, carrying, drying, stacking, and burning."

How strangely do variations in one branch of commerce affect the arrangements of another! Twenty years ago common table-salt was sold at four or five pence per pound; but when the duty was wholly removed, the price fell to one halfpenny. Manufacturers immediately turned their attention to this substance, as a source whence saleable commodities might be produced. Common salt is formed of chlorine and sodium, and by chemical agency the two can be separated, and each one made to combine with some other substance. Such has been the case in respect to the soda used in the soap manufacture; by far the greater part of it is produced from the sodium which forms one of the ingredients in common salt, the decomposition of which in sufficient quantities to supply the soap and glass makers has for some years employed large capitals and many hundreds of workmen. This alkali, or 'white ash,' as it is called, made from salt, has driven kelp and barilla out of use. It is produced by treating common salt in a peculiar manner with sulphuric acid, from which there result muriatic acid and sulphate of soda; this sulphate is converted into a carbonate of soda by contact with carbon; and, lastly, the carbonic acid is driven from the carbonate, leaving the soda in a caustic state, and forming, when in solution with water, the liquor which soapmakers call a ley or lye. The ley is pumped out of the vats into the boilers, where it is mixed with the requisite quantity of tallow, and any other fatty substance which may be employed. The mixture is then heated by steam, and well boiled, an attendant stirring the mass occasionally. After a time the tallow is found to have combined with a portion of the ley, including all the alkali, and the remaining, or spent ley, is then of no further use in the process. It is pumped up from beneath the soap by a pump whose barrel descends to the bottom of the copper; and a fresh supply of ley is introduced. Again and again is this process repeated, new leys being introduced after the spent ley is withdrawn, and the leys being used in a stronger or more alkaline state as the process advances towards completion. When the soap is nearly finished, that peculiar appearance to which it owes the name of 'mottled' soap is given to it by sprinkling upon the surface a small quantity of very dense and strong ley; this percolates slowly through the mass of soap, and leaves in its track those dark coloured veins which constitute mottling.

When the tallow and alkali have completely formed in soap, and have attained a proper consistancy, the soap is laded from the coppers in buckets or pails, and conveyed to the frame-room, where it is poured into the frames. These frames have, until within the last few years, been made wholly of wood, but cast-iron frames are now occasionally used. The wooden frame is a kind of well or cistern, formed of a pile or heap of frames laid one on another. Each separate part consists of a rectangle of four bars of wood, measuring internally forty-five inches by fifteen; and these rectangles are laid one upon another to a height of ten or twelve feet. The bars of the rectangles are so neatly squared and smoothed, as to fit closely one upon another. The mottled soap is poured into these frames until full, and there allowed to remain till cold, which occupies more or less time according to the state of the weather.
When the mass of soap is cold and solidified, some iron fastenings, with which the rectangles of the frame were firmly bound together, are loosened, and the rectangles removed one by one, each one being lifted off the mass of soap. The soap is then presented to view as a compact body, whose dimensions are those of the interior cavity of the frame. Some of these masses of soap weigh three or four thousand pounds each. The next process is to cut the mass into slabs or slices about three inches in thickness. To effect this a man marks the surface of the soap with parallel lines, by means of sharp points inserted in a gauge-stick; and two men draw a piece of wire through the soap in the direction of each mark, one man holding the wire by handles at the ends, and the other guiding the wire to the proper marks. The slabs are next taken to a machine in the form of a hollow box open at the top, with vertical crevices passing from the top nearly to the bottom of two opposite sides. The slabs being ranged horizontally in this box, a piece of wire is passed down each of the crevices in succession, cutting through the slabs in its progress. As the crevices are about three inches apart, it follows that the slabs are cut into bars about three inches wide and the same in depth, the length being about fifteen inches. These are the bars in which soap is sold in the shops. After the cutting, the bars of soap are piled one upon another in the form of a wall, and kept in that state for a certain time until required to be removed from the factory.

For curd or white soap the same general description will suffice as applies to mottled, with some minor exceptions. As its whiteness is one of its chief characteristics, the tallow is selected with more care, and no ingredients are introduced which will be liable to deteriorate the colour. The process of melting and combining with an alkali, the melting and boiling of the ingredients, the framing, the cutting, &c., is much the same as in the manufacture of mottled soap.

Yellow soap is less expensive than white or mottled; and it owns this cheapness, as well as its colour, and certain properties which it possesses, to the large employment of palm oil and resin in its composition. Although resin is in appearance very different from tallow, yet it possesses the same property of melting and combining with an alkali, and forming a soap by the combination. The analysis differs little in pure soap from that of mottled, and consists generally of 6 alkali, 62 grease, 32 water. Inferior soap, although in appearance nearly the same, contains from 10 to 20 per cent. more water, the knowledge of which will, we hope, be useful to our readers. The nature and source of resin are simply as follows:—From several species of the pine-tree there exudes, when an incision is made, a grey-coloured semi-fluid substance, known in commerce by the name of turpentine. This turpentine has the distinctive names of Venice, Strassburg, Carpathian, Canada, Cyprus, and common turpentine, according to the countries whence it is brought, and the species of pine from which it exudes. By distillation common turpentine yields the oil or essence of turpentine, and the solid residue constitutes resin.

Palm oil is obtained from the oil-palm of Guinea, cultivated in the western parts of Africa. The fruit of this tree is ovoid, about the size of a pigeon's egg, with its outer shell of a yellowish covering of a golden yellow colour. The oil is obtained by bruising the fleshy part of the fruit, and subjecting the bruised paste to boiling water in wooden mortars: an oil of an orange-yellow colour separates, which concretes, when cool, to the consistency of butter, and has, when fresh, the smell of violets, and a slightly sweetish taste. The Africains use this oil in cookery, and for anointing the body; but when imported into England, it is used in soap-making, in perfumery, and in medicine, for which purposes two or three hundred thousand cwt.s. are used annually. When brought to the soap-factory it is in casks in a solid state; and the mode adopted for extracting it, is to place the cask over a trough with its long side downwards, and to pass a strip of lead around the cask, by which means the palm-oil is brought to a liquid state and made to flow out of the cask. The oil is afterwards conveyed to a vat, where it is bleached by a chemical process. The use of this oil in soap, or wherever it can be introduced, is a matter of much or more importance to the philanthropist and the statesman than to the manufacturer. For while the former looks at it merely as a good and cheap ingredient; the philanthropist views it as the most powerful instrument he can employ in the abolition of the traffic in slaves; the statesman feels that it secures to our manufacturers a most lucrative barter trade, free from fiscal regulations, which impede our commerce with old Holland and Spain, and which are a serious obstacle to our manufac-turers does more to impede the traffic in slaves than a host of treaties and protocols with European states.

The mode of preparing the alkali for yellow soap, the process of melting and boiling it with the tallow and resin, and the general routine of manufacture, differ little from those of mottled. The frames used are, however, very different. They are made of five pieces of cast-iron: one for the bottom, two for the sides, and two for the ends. By a simple mode of fastening at the edges, the whole can be quickly put together, so as to form a sort of well or cistern, between four and five feet high, forty-five inches long, and fifteen wide. Into these frames the yellow soap is poured, the contents of each being about fifteen cwt. These frames are not only put together and taken to pieces with more ease than the wooden frames, but the iron being a good conductor of heat, the process of cooling is effected more rapidly. The cutting of yellow soap into slabs and bars is effected in the same way as that of mottled.

Soft soap, a commodity which is almost exclusively used in the woollen manufacture, differs considerably from hard soap in its ingredients, its consistence, and its general appearance. Both the alkaline and the oleaginous ingredients are different from those employed in hard soaps; since potash is employed instead of caustic soda, and oils are used in place of tallow. This soap, when of good quality, consists of alkali 9, oil and tallow 42, water 40; total 100. The potash employed in the soap-manufacture is brought prin-
The candles are pushed by the rucsc...
machinery, the candles are forced out of the moulds and thrown on a table in parallel lines. The wicks in these candles are still connected with the coils of cotton wound round the little reeds in the frames or cases; but the whole are severed in a few seconds by the attendant workman, when the candles are finished. All the mould-frames move along a double line of railroad, and the whole of the arrangements are so judiciously made that a man and a boy can manage the whole, and produce a surprising number of moulded candles in a short time.

The common 'dip' or 'store' candles are made, as most persons are aware, by dipping the wicks into a vessel containing melted tallow, a small coating of which adheres to the cotton fibres, as do likewise the subsequent coatings to that first laid on. The wicks are prepared at the factory in the following manner:—

Balls of cotton, each weighing about three pounds, are procured from Manchester or the surrounding district, the cotton being previously made into a loose roving or cord, consisting of a dozen or more threads slightly cohering. These cords (if we may so term them) are of different thicknesses, according to the size of the intended wick; the wick for these candles known as 'eights,' for example, containing thirteen cotton threads. A great number of these balls are carried to the wick-making machine, and put into a box or drawer. A man takes the ends of all these balls, doubles a portion of each cord round a broach or stick, and by a sharp blade (somewhat like that by which tobacco is shredded) cuts all the cottons to proper lengths for wicks, giving to the whole of them, by the action of the machine, a slight twist before he removes them. One stick-full of wicks being thus made, another is prepared in a similar manner; and thus the preparation of wicks proceeds with great rapidity. By this machine one man will prepare the wicks for fourteen or sixteen makers. The wicks for some candles are twisted or spun in a particular manner, but this is effected at the cotton-manufactory.

In making dip-candles by hand, a man takes three broaches or sticks, each containing as many wicks as will suffice for about two pounds of candles, and holding them parallel and horizontal, dips the wicks into a trough of melted tallow. This he does two or three times, and then lightly draws the lower ends of the wicks over a sloping board, to remove the drainings of tallow. These three broaches are hung up for the tallow to dry and harden; another set are similarly treated, and so on. When the first dipping or 'lay' is dry, the coated wicks are dipped a second time; afterwards a third and a fourth; the number of repetitions depending on the size of the intended candles, and being about twelve for the candles known as 'twelves.' By the machines now employed, however, the operations are surprisingly hastened. At the time we witnessed the processes at the factory, one of the machines was employed in making 'twelves,' and was thus arranged:—Twenty-four candles were hung on each broach or stick; thirty broaches were ranged side by side, and formed an assemblage called a 'frame;' and thirty-six of these frames were attached to or suspended from the machine, so that the entire number of candles attached to the machine amounted to nearly twenty-six thousand, the whole of which were made, by one man and a boy, between six o'clock in the morning and four in the afternoon of the same day. In the front of each machine is a vessel of melted tallow, and the thirty-six 'frames' are so attached to the machine, that each can, in its turn, be brought over the tallow vessel, and the candles dipped in it. A piece of apparatus, called a 'wiping-board,' is, after each dipping, ingeniously brought down, by a lever moved by the foot, over the cistern; the ends of the candles are wiped on it, and the board rapidly re-ascends to its former position. There are two varieties of dipping-machines used at this factory, differing somewhat in the mechanical arrangement whereby the 'frames' are brought over the melted tallow, but similar in respect of the great saving in time and labour occasioned by their use. When the candles have been dipped a sufficient number of times (which is known by the use of a kind of steelyard or balance-weight indicating the total weight of all the candles on the machine), and are properly hardened, they are weighed up into pounds, and hung upon strings, the former by men, and the latter by boys, each of whom exhibits great dexterity and quickness in the operation.

Those long and slender candles known as 'rushlights' differ only from common dip-candles in the material of which the wick is made. Instead of fibres of cotton, the wicks are made of dry rushes, which have a loop made at one end by piercing the rush with a sharp instrument, and are then cut to the required length by a gauge or knife. The dipping is conducted much in the same manner as for common candles, except that, from the comparatively small number required, the machine is not employed. Taking the 'moulds,' 'dips,' and 'rushlights' together, there have been as many as twenty millions of candles made in this factory in one year.
The whole of the sixteenth century was marked by important changes of every kind—political, religious, and social. The wars with France and the internal contests of the Roses were over, and the energy of the nation was directed to new objects. Trade and commerce were extended; fresh sources of wealth were developed; and new classes of society sprung into importance, whose riches enabled them to outvie the old landed gentry, but who had few of their hereditary tastes and habits. Hence the innovation of old customs, and the decay of ancient manners, to which the gentry themselves were compelled to conform. The following old song, which is printed in the 'Percy Reliques,' from an ancient black-letter copy in the 'Pepys Collection,' is a lament over the changes which had taken place in the early part of the seventeenth century, as compared with the days of 'Queen Bess.' An account of some of the most striking of these changes will appear in future numbers, and we now give this favourite old song by way of introduction:

"An old song made by an aged old pate, Of an old worshipful gentleman, who had a great estate, That kept a brave old house at a bountiful rate, And an old porter to relieve the poor at his gate; Like an old courtier of the queen's, And the queen's old courtier.

"And an old porter to relieve the poor at his gate."
vations in the Alps and Andes have not failed to experience the effects of the rarefaction. The first Spaniards who attempted the ascent of the high mountains of America were attacked by sickness and pains in the stomach. The French traveller Bouguer had several hitherto unattempted on the Cordillas of Quito. Zumstein was attacked nearly in a similar manner while ascending Mount Rosa in Switzerland. Saussure was indisposed at the summit of Mont Blanc, and experienced a distressing sensation of faintness; his guides, who were all natives of the valley of Chamouni, were affected in the same manner; and Saussure found that this disposition increased when he moved, or when, while observing his instruments, he directed his attention to a particular object.

Dr. Holland, in his valuable 'Medical Notes and Reflections,' expresses an opinion that the action of different degrees of atmospheric pressure in disturbing the bodily functions and general health is rather dependent on the frequency of fluctuation, than from any state long continued, either above or below the average.

Hitherto atmospheric pressure has been more studied in relation to aeronautics, weather, the construction and use of the balloon, than by the sudden change of temperature, and by a noise in the ears, compared by some to very distant thunder; the latter sensation occurring only during rapid ascent or descent of the balloon, and, when greatest in degree, far less distressing than that produced by descent in a diving-bell. He hastens to explain the connexion between the sudden change of atmospheric pressure in the balloon, or when suddenly passing into a very cold atmosphere. His pulse is occasionally quickened ten or fifteen beats, and this only when some such excitement has been sustained. He mentions to me expressly, that in no instance have his companions experienced vogue or sickness.

It might seem, at first thought, that the opinions above expressed are inconsistent with the recorded experience of the travellers who have ascended high mountains. But there is a circumstance which has great influence on these sensations, and ought by no means to be overlooked. The aeronaut who ascends in a balloon has very little muscular exertion during the time that he is in his aerial ship; whereas such men as Saussure, Humboldt, and Boussingault are exposed to the severe fatigue of walking and climbing up hill while exposed to a rarefied atmosphere. We shall presently speak of a particular mode of explanation which has been recently given in relation to the sensations and fatigue experienced in these land ascents. But we shall first give Boussingault's description of the sensations which he experienced on such an occasion.

In the year 1831 M. Boussingault succeeded in reaching the summit of Chimborazo, a feat which had been unsuccessfully attempted by many persons, and which he was excited by the energy and perseverance of Humboldt thirty years before. The traveller, accompanied by Colonel Hall and an Indian guide, had reached to a considerable height up the
mountain, equal indeed to the height of Mont Blanc, the mules began to pause for breath at almost every step; they breathed quickly, and were evidently distressed. They continued to ascend slowly, and found the difficulty of breathing to be thus increased; the travellers stopped every eight or ten paces, by which they seemed to gain relief; and Boussingault remarked that the difficulty of breathing seemed to be greater when they were passing over a snowly surface, than when on the dry earth or rock of the mountain. Being unable to proceed higher that day, they descended, and spent their night at the height of 15,000 feet. On the following day (Dec. 16) they set off again, and when they reached the limits of the snow, they dismounted from their mules, and made the rest of the journey on foot. The mules seemed quite incapable of proceeding farther; their ears, which are generally erect, were turned downwards; and, during the numerous pauses the animals made for the purpose of breathing, they did not cease looking on the plain beneath. The three travellers walked, or rather climbed, one behind another; and Boussingault says, "We preserved perfect silence during our march, for experience had taught me that at such a height nothing is more hurtful than a continued conversation; and when we exchanged a few words during a halt, it was in a low tone, which was only intended to contribute the good which I have invariably enjoyed during all my ascents to volcanoes. I impressed, in a despotic manner, this salutary precaution on my companions. An Indian who neglected this advice on descending the mountain, the rarefaction of the air affected the action of the muscles. He thinks that the weight necessary for the performance of such active movements as running, jumping, or climbing, is borne or felt to any great extent by standing still; every two or three steps, and oftentimes to sit down; the muscles, the muscular force being directed to the companions. An Indian who neglected this advice on descending the mountain, the rarefaction of the air affected the action of the muscles. He thinks that the weight necessary for the performance of such active movements as running, jumping, or climbing, is borne or felt to any great extent by standing still; every two or three steps, and oftentimes to sit down; the muscles, the muscular force being directed to the

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place and support the bone; as otherwise the two surfaces of the bone would recede from each other. It is then natural to expect that when the bone is supported in this less advantageous manner, which not only causes an expenditure of strength, but also obstructs the movements of the bone owing to the stiffness that is induced in the muscles called into action, derangements and inconveniences should take place in walking, which would not occur if the bone were kept in equilibrium by the pressure of the air."

In conformity with the wishes of Humboldt, Weber presented a human thigh-bone (which had the bony part of the pelvis, cut away such parts of the bones as were not necessary to the experiment), and cut through the membrane which enveloped the jointed parts. The bones were then hung up within the receiver of an air-pump, and the air gradually exhausted. Although the membrane which connected the two parts together was severed, yet the bone remained as close as before; until the air had been exhausted to three inches of barometrical pressure, when the head of the thighbone sank. It became evident that the external pressure of the air kept the head of the bone closely in its socket so long as the pressure was anything considerable; but when the exhaustion was proceeding towards a vacuum, the pressure became inadequate to support the bone. The muscular force was directed to the lower bone, to make it approach more nearly to the real weight of the leg; and upon allowing the air to re-enter, the head of the bone was forced up into its former position in the socket.

The minutiae of the experiment cannot be detailed here, but Weber's conclusion was as follows:—In the course of the ascent the external pressure being taken off the bones, the muscles would have to be exerted in a preliminary resistance, which produces a sensation of fatigue, and also explains why aeronauts, whose legs are not exposed to the same degree of fatigue as those of men who are walking on the ground, yet often become fatigued, but as this straining is opposed to the swing which has to be performed in walking, a feeling of uneasiness and inconvenience occurs in walking, in Weber's opinion, explains the described sensation of fatigue, and also explains why aeronauts, whose legs are not exposed to the same exercise, do not experience this kind of fatigue. The fatigue experienced by persons who are lame from some defect in the thigh-joint is supposed to be often partly owing to a diminution, or rather rearrangement of the atmospheric support to the thigh-bone.

Culinary Delicacies of the Thirteenth Century.—A book just printed by the Roxburgh Club, from the original records of several ancient families, contains some very curious details of the style of living of the highest classes in England in the thirteenth and fourteenth centuries:—"The distinguished peculiarity, not only of England but of European taste in food, during the middle ages, was a predilection for the strong, and, in some cases, for the coarsest dishes. To what other causes are we to ascribe the appearance of the flesh of the whale, grampus, porpoise, sea-calf, sea-ox, and other such fish, at the tables of sovereigns and people of rank, by whom they were considered delicacies? Some notion may be formed of the quantity of whale, &c. which runs ashore, when we find Henry the Third, in 1249, ordering the sheriffs of London to purchase for him, in the city, a hundred pieces of the best whale and two porpoises."—Manners and Household Expenses in the Thirteenth and Fourteenth Centuries, H. 2.
CATTLE-SHOWS.

If we were to ask why Christmas is so proverbial for show in December, 1841, there were exhibited fifty-seven oxen, nineteen cows, fifty-four sheep, and nine pigs, the animals of each species being the most perfect examples of the excellence to which they have been brought by the judgment and experience of breeders, graziers, and feeders. The Scotch oxen had in some cases been brought by steam-boats a distance exceeding five hundred miles; and in nearly every case the railways were made use of for the conveyance of both cattle and sheep from all parts of England. Formerly the animals were brought in vans to London, at a great expense, and the rate of travelling was necessarily slow. The interest of the show is, as may be expected, chiefly confined to certain classes. On entering the place of exhibition, the visitor at once perceives that the company consists chiefly of country gentlemen, cattle-breeders, graziers, cattle-salesmen, and butchers, with a sprinkling of townsmen, who still retain the relish for anything connected with country occupations which they had imbibed in early life. But the sight is one of rational interest to any man. Here he sees the results of exertions principally carried on during the last eighty years to unite and bring to perfection the most desirable points in the various breeds of domestic animals which were once peculiar to different parts of Great Britain, but are now spread in every part of the country. Formerly once inactivity.

The Smithfield Cattle Club was established about the close of the last century. Prizes were offered for the finest cattle and sheep, which were publicly exhibited in the metropolis; and the butchers purchased the stock as a means of enhancing the reputation of their shops. For the last two or three years, the show has been held at the Horse Bazaar, King-street, Portman-square, which, though not quite so convenient as could be wished, is preferable to the former exhibition-yard in Aldersgate-street. After the prizes have been adjudged, the public are admitted on payment of one shilling during the remainder of the week. At the show in December, 1841, there were exhibited fifty-seven oxen, nineteen cows, fifty-four sheep, and nine pigs, the animals of each species being the most perfect examples of the excellence to which they have been brought by the judgment and experience of breeders, graziers, and feeders. The Scotch oxen had in some cases been brought by steam-boats a distance exceeding five hundred miles; and in nearly every case the railways were made use of for the conveyance of both cattle and sheep from all parts of England. Formerly the animals were brought in vans to London, at a great expense, and the rate of travelling was necessarily slow. The interest of the show is, as may be expected, chiefly confined to certain classes. On entering the place of exhibition, the visitor at once perceives that the company consists chiefly of country gentlemen, cattle-breeders, graziers, cattle-salesmen, and butchers, with a sprinkling of townsmen, who still retain the relish for anything connected with country occupations which they had imbibed in early life. But the sight is one of rational interest to any man. Here he sees the results of exertions principally carried on during the last eighty years to unite and bring to perfection the most desirable points in the various breeds of domestic animals which were once peculiar to different parts of Great Britain, but are now spread in every part of the country. Formerly once inactivity.

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enables the farmer to increase the produce of his arable land. Hence the best stimulus of agriculture is the prosperity and well-being of the great mass of the population; and no impulse which could be given to British agriculture would be equal in its productive results to the conversion of potato-feeders and bread-eaters into consumers of animal food.* The profit of turnip and other green crops would then be greatly increased; and the whole of the modern improvements in agriculture depend upon these rotations. It is a maxim of the farmer, that if no turnips, then no fat cattle or fat sheep, no manure, no barley, no clover, and no wheat. With turnips and similar crops we have fat cattle and fresh meat at Christmas, while our ancestors were compelled to kill off their cattle when the pastures began to fail in autumn, and they lived upon salt meat for the ensuing six months. Few livestock could then be kept upon a farm, and the powers of the soil were reduced to the lowest point of fertility from the want of manure. All this is now changed, and the alteration has been a most beneficial one to all classes.

TRIAL BY ORDEAL.

[Concluded from page 405.]

There were yet many who failed at these trials, and these persons were often pursued with relentless severity: indeed, it is obvious that the same processes which by collusion might be made to throw a shield over the guilt of the powerful and influential, might also be converted into a means for the cruel persecution of the unprotected. M. Dinaux translates from an old chronicle the account of a young woman driven into the proof of ordeals under the name of a new accusation of sorcery, in consequence of her having excited the indignation of the mayor of the place by attempting to arouse one of the imbecile early kings of France to an appreciation of the duties and dignities of his station. Her arm was cruelly burned by the hot water, and she only escaped death itself by flying to the sanctuary of a monastery. A citizen of London, suspected of murder, says Hallam, having failed in the ordeal of cold water, was hanged by order of Henry II., although he offered five hundred marks for his life. It seemed, he adds, as if the ordeal was sometimes permitted to persons already convicted of a jury.

* Some recent statistical inquiries in the manufacturing districts show the great falling off which takes place in the consumption of meat during a period of stagnation in trade. The oxen, sheep, calves, lambs, and pigs slaughtered in the boroughs of Leeds declined from 2450 in 1835-6 to 1800 in 1841. In Rochdale in 1836 the number of oxen killed weekly was 150; in 1841 only 65 or 70,
battle are, Blackstone observes, those of Gundebald (501), preserved in the Burgundian code, yet the cus-

As before observed, ordeals of various kinds have prevailed in different parts of the world. Some African

tom custom probably prevailed among various other of the northern clans or tribes, and judicial combats existed among the ancient Goths in Sweden.

We have no record of the custom prevailing in this country prior to the Contest, but, from the tenor of

some of the laws upon the subject, made by William L.,

Sir Francis Palgrave considers it probable that the

ordeal of the duel existed in England prior to the

Norman invasion, but became modified in its details after that event. Restricted in its early use to certain

criminal cases, this mode of trial became afterwards almost indispensable, as from the means of de-

cision of almost every description of crime and dispute. In the reign of Henry II, many cases were removed

from its operation, by presenting to the accused the
alternative of the jury, a change truly characterized by

Glanvill as a noble improvement. Louis the Pious

followed Henry's example in 1260, and the practice of

duel soon after became much resorted to in the

kingdoms of Europe. The last occasion of a trial by

battle actually taking place in this country occurred in

the thirteenth year of Queen Elizabeth, and was held in

Tothill-fields. After lying dormant for more than two
centuries, the very existence of the absurd statutes
allowing these proceedings was nearly forgotten, when,
in 1817, the public were astounded by the wager of

battle being demanded and allowed by the King's Bench.
The accuser wisely forbore proceeding, and in the

subsequent year the statute was repealed.

Religious ceremonies also accompanied this form of

trial, the two combatants making most solemn attest-
ations and recriminations. The champions armed with

batons (and in some cases with sword and lance) ap-

peared in the lists at sunrise, and, after the various
formalities, continued their contest until one of the
two was killed (which rarely happened), or declared
himself vanquished by pronouncing the odious word

eraren. If, however, the battle continued until the

stars appeared, it was considered as drawn, and ter-
minal in favour of the defendant. In civil cases the

parties contended by means of deputies or cham-
pions, and the challenge delivered by the champion at

our coronations has its origin in this custom; but in
cases of felony the party must appear in his proper
person, only in this case, if the appellant be a woman,
an infant, one aged sixty, or lame, or blind, he or she
might be replaced by the wife, mother, or sister, or a
peer, by reason of his dignity, and a citizen of Lon-
don, by special charter, were also exempted: a thief or
murderer, taken in the very act of committing his
crime, was not permitted the wager of battle. When

vanquished, even the hired champion in a civil cause
became disgraced and infamous, and ever after inca-
nable of serving on a jury or appearing as a witness.

In cases of felony, if the accused was vanquished, he
was either hanged or mutilated. In the reign of Wil-

liam Rufus, Geoffrey Bainard appealed William de

Eu, charging him with treason: the defendant was

vanquished, and afterwards mutilated by order of the

king. If the accuser turns recreant, and cries eraren, he
was ever afterwards infamous, losing any privilege
he might have possessed. Although many members
of the church vigorously opposed these barbarian
practices, others encouraged and participated in them.

Dulaure, in his ' History of Paris,' cites numerous
instances of religious communities applying for and
obtaining of various monarchs the privilege of holding
lists, and at the expense of some times substituting
the arena. Geoffrey of Vendôme tells us of a duel
between a monk and a canon. Considerable en-

avourments resulted from the fees paid for administering the
oaths, the masses for those who fell, &c,
mournful proof that the advancement of national morals is not always coincident with great intellectual progress and vast physical improvements. Were this the case, humanity could never be shocked, or common sense Insulted, by the spectacle of a man cruelly aggrieved being compelled to offer his breast to the deadly aim of the wretch who has wronged him, and he himself obliged to risk the imbruing his hands in the blood of his fellow-creature. Such proceedings are worthy only of that rude state of society wherein private vengeance is permitted to usurp the place of public justice, and in which the possession of personal address and brute courage are considered the objects of the highest esteem. Of course, men have opened their eyes in some measure to the folly and wickedness of this practice. May they do so more and more, for much remains to be done. It is from an enlightened public opinion that we are alone to look for its abolition. Severe penal laws, contrary as they are to the spirit of the age, will either be evaded or reformed. An improved and extended moral and police system, however, can alone teach mankind to wither that with their reprobation which now only flourishes in consequence of the encouragement they have in their ignorance bestowed upon it.

PEQUEILARITIES RESPECTING THE GROWTH OF FISHES.

(From a Correspondent.)

Among the three great families of birds, beasts, and fishes, by far the greatest dissimilarity observable in the various orders and classes into which they are divided is known to obtain among several species of fishes. That birds, or animals, or even fish, in a state of domestication, should somewhat depart from their natural shape, and often be nothing remarkable; but when we find any considerable departure, whether in size or any other positive characteristic, from the class or order to which they belong while in an unconfined state of nature, it becomes an object calculated to arrest the attention of nature's observers, and one well deserving the observation of the physiologist. There are perhaps no cases more striking, than a superficial view of the subject, in order to establish the position here advanced, the common trout may be taken as an example of what is above referred to; and, probably, there is scarcely another well known fish that would answer so well to illustrate the disparity which sometimes takes place.

Observing at the several families of wild animals of this country, from the smallest of the mouse tribe upwards to the stag or wild deer, we may meet with slight differences in size, colour, &c.; but unless there is some natural imperfection, take five, or fifty, or five hundred, promiscuously from any one family, and among those that have attained their natural growth, the disparity in point of size will be hardly observable, or at least by no means striking. Indeed wild cattle might be instanced, a few specimens of which are still preserved in this country, and we find them 'as much like each other,' to make use of a homely expression, 'as peas.' Males and females frequently differ in size, in shape, and sometimes in colour; but such variations are the result of a general law, and do not affect the results we have stated. In birds there is as little, or even less, disparity in point of size. Observe, for instance, a flock of crows, of wild pigeons, of field-fa#res, or of wild geese, and in the closest approach we can make to them, among five hundred the eye would hardly be able to detect any actual difference.

With regard then to the trout so common to our streams and rivers, among those that may be considered full grown, the difference, particularly in point of size, is often very remarkable: the smaller the stream, the smaller will be the trout found therein, may be taken as a general rule. But this rule does not apply to any small streams; for a brook of considerable size, or very moderate sized rivers, will often yield trout equal in size and quality to those found in our largest rivers. Something depends upon the supply of food; but it is well known that trout kept in small ponds or streams, where they have received a regular daily supply of food besides what the water afforded them, have never attained a large size, a size even approaching those that were permitted to occupy large ponds or those kept in the same neighbourhood, where both the water and the food were precisely of the same quality and character. With regard to small streams where the fish are not protected, it might be asserted with some show of reason that but few trout in such situations escape the angler or the net-fisher for any considerable number of years. This may be true as regards the generality of such streams, but in certain situations even small brooks possess permanent localities, like a hole, a hollow between two ridges of hills which the trout delighted to feed. This sheet of water was formed in a hollow between two ridges of hills which were watered by a small runnel that had its source in the moors above. Small, however, as this stream was, for it bubbled and danced along in a channel which was scarcely more
than a gutter with grass-grown sides, one or two feet over, it used to be pretty well supplied with small trout, mostly too small to attract the notice of the shepherd's boy, or any equally ambitious angler; nor was there in the distance this brook ran a single hole or secure place that by possibility afforded shelter and safety to any fish of full-grown size. After the rains the melting snows of two winters had filled this reservoir to the necessary height, the water was then occasionally drawn off for the supply of the canal through an iron grating, so narrow between the bars as not to admit the outward passage of any fish that weighed more than two ounces; and as it passed down a steep declivity with great velocity, there was no probability of any fish being able to ascend the current.

Some curiosity was felt in the neighbourhood, and particularly amongst anglers, with regard to this reservoir becoming stocked with such trout as would yield both amusement and profit. Two years had scarcely elapsed, however, when it was satisfactorily ascertained that there were many trout in the reservoir, and some of them of considerable size; and by the end of the season angling in the reservoir had become quite common, when trout were caught that weighed from one to two pounds each: in after-years some of a still larger size.

In a few years the “reservoir trout” became in such repute, and were so eagerly and perseveringly angled for, that the gentleman claiming the manorial right of the pond set about securing it and his lands by the end of the season angling in the reservoir had become quite common, when trout were caught that weighed from one to two pounds each: in after-years some of a still larger size.

Some writers have asserted, that among the numerous branches of the human family there exists a greater disparity, in point of size, than among any other order of created beings. This does not, however, seem to be borne out by facts; for unless we were to include Lilliputians and fabled giants, we should find in many families of fishes a far greater difference as regards size. Among salmon it has been ascertained that many may be considered full-grown that do not weigh over twelve or fourteen pounds; while one is occasionally caught of the weight of fifty or sixty pounds. In natural history it is customary to give the height, length, and bulk of most classes of animals; and the weight, as well as the height and spread of wing, of birds of every description; but as regards many sorts of fishes, this is altogether impracticable, for in many small streams a trout weighing half a pound would be accounted an extraordinary size, while in some of our rivers we occasionally meet with one of the weight of two or three pounds, and in others some that reach even to nine or ten.

Musé of Nature in Norway.—Still as everything is to the eye, sometimes for a hundred miles together along these deep sea-valleys, there is rarely silence. The ear is kept awake by a thousand voices. In the summer there are cataracts leaping from ledge to ledge of the rocks, and there is the bleating of the kids that browse there, and the flap of the great geese that do not fly abroad from its eyrie, and the cries of whole clouds of sea-birds which inhabit the islets; and all these sounds are mingled and multiplied by the strong echoes till they become a din as loud as that of a city. Even at night, when the flocks are in the fold, and the birds at roost, and the echoes themselves seem to be asleep, there is occasionally a sweet music heard, too soft for even the listening ear to catch by day. Every breath of summer wind that steals through the pine forests wakes this music as it goes. The secret of the pines, that vibrate with the breeze, like the strings of a musical instrument, so that every breath of the night wind in a Norwegian forest waakens a myriad of tiny harps, and this gentle and mournful music may be heard in gushes the whole night through. This music of course ceases when each tree becomes laden with snow; but yet there is sound in the midst of the longest winter night. There is the rumble of some avalanche, as, after a drifting storm, a mass of snow too heavy to keep its place slides and tumbles from the mountain peak. There is also now and then a loud crack of the ice in the freezing lake or glacier; and, as many declare, there is music heard by those who listen when the northern lights are shooting and blazing across the sky. Nor is this all. Whenever there is a break between the rocks on the shore, where a man may build a house and clear a field or two, there is a platform beside the cataract, where the Sawyer may plant his mill, and make a path for it to join some road, there is a human habitation, and the sounds that belong to it. Thence in winter nights come music and laughter, and the tread of dancers, and the hum of many voices, and other sounds; and they hold their gay meetings in defiance of their arctic climate, through every season of the year.—Miss Martineau's Peats on the Fiord.
HOSPITALITY AND CHARITY OF OLD TIMES.

The popular imagination is still vivid with pictures of the hospitality and charity which once prevailed in England. Amongst persons who have few opportunities of reading, or who cannot read at all, this is the only feature of the past with which their minds are strongly impressed. Of the other parts, which are necessary to be known before the past can be justly appreciated, they do not possess even an outline. Being ignorant of the economical circumstances which were favourable to the old bountiful style of living in former times, as well as of the causes which led to its decay, it is impossible that they should not look on the present as an age of harsh and unkindly contrasts. We shall here give a few illustrations of the magnificent hospitality which was characteristic of our ancestors three or four centuries ago; and, at another time, notice some of the causes which necessarily led to a different distribution of the means by which it was sustained.

It must be recollected that, at the period to which we allude, there were few populous cities and towns. At the end of the fourteenth century, England scarcely contained thirty towns with above two thousand inhabitants, and of these, two only, besides London, contained a population of ten thousand each. London itself, according to the capitation returns of 1377, did not contain a very much larger population than the town of Sydney in New South Wales, which was first planted little more than half a century ago. The population of the towns of the realm scarcely amounted at this time to seven persons out of each hundred of the total population, the remaining ninety-three dwelling in hamlets and country places. These facts show that the industry of the country was almost entirely agricultural. The exports consisted of little else than raw produce, principally wool, and foreign trade was carried on chiefly by aliens. There was wealth, but it was such as may be seen in a country ramble, and consisted for the most part of flocks and herds, horses, crops on the ground, and stores in the granary. Of wealth directly convertible into a thousand different objects, there was even amongst the richest a great scarcity.

The great landowner of that day, so rich in the means of abundant living, and, generally speaking, so poor as far as money was concerned, lived at his manors in different parts of the country. His tenants consisted of 'villains regardant,' holding by base and uncertain services according to the custom of the manor; and the 'villains in gross,' or serfs, were his carters, ploughmen, shepherds, cowherds, and swineherds—also his artisans and handicraftsmen. His wools were the principal objects of commercial de-
mound which he was able to raise, as the greater part of the produce of his manors was consumed on the spot. The dukes and earls, and other gentlemen and menials among whom he had the happy carelessness and freedom from anxiety which distinguishes a state of society akin to slavery. In these scenes the lord exercised and strengthened his personal influence, and diffused around his board the glow of pleasure and attachment. The great baron had his master of the horse, his auditor, steward of the household, and other officers performing the same duties as in the court of the sovereign.

Political as well as economical causes tended to increase the number of retainers. The aristocracy beard the crown and forced concessions from it by an imposing array of armed followers, who generally accompanied them wherever a parliament was assembled. Why then, in the reign of Richard II., was it not that of the Earl of Northumberland, whose Household Book is so well known. The duke kept the Christmas of 1507 at Thurnbury, in Gloucestershire. The number who dined on Christmas-day was two hundred and ninety-four, consisting of ninety-five gentry, one hundred and ninety-seven yeomen, and seventy-nine grooms; and at supper there were eighty-four gentry, one hundred and forty-one valets, and ninety-two garçons. Among the persons of inferior note are mentioned a hermit, a bondman, a joiner, a brickmaker, an embroiderer with two assistants, the abbot of Kingswood and the dean of the chapel performed the religious service of the day, assisted by eighteen singing-men and nine boys as choristers.

From the accounts it appears that loaves and manchets were delivered from the pantry; wine from the cellar, ale from the buttery; salt-meat, salt-fish, and fresh provisions, are under the head of kitchen deliveries; Paris candles, &c. are from the chandlery; and there is a head for coal and charcoal supplied to the hall and parlour; and also one for the consumption of the stables. On Twelfth-day there were thirty-six rounds of beef at table, and a dish of lamb. But we give an abstract from the accounts for one day (Twelfth-day), which will afford the best idea of the plentiful style of living:—

**Pantry** — Spent six hundred
The kitchen of the old baronial mansions were of the want of greatness in what we saw, but from a want of common
sense of a plant. — Journal of a Naturalist,

The formal title of the page is "THE PENNY MAGAZINE" and the text appears to be a description of a kitchen in some grand manor or castle. It mentions items such as "three quarters of mutton, 14s.", "six geese, 5s.", etc., along with descriptions of the architecture and style of the kitchen. The text is written in a formal, historical style, possibly from the 19th century, and describes the rooms and their contents in detail. The text is not easily readable due to the formatting and alignment issues, but it appears to be a detailed description of a grand kitchen.
THE ELM.

The stately and elegant elm, though inferior to the oak in strength and majesty, is a favourite ornament of the park and pleasure-ground, and being also very commonly planted in the hedge-row, gives a rich appearance even to a flat country, while the green lane, as all who enjoy a rural walk are aware, is rendered more pleasant by its embowering branches. It is moreover truly an English tree, and if not indigenous, it at least overshadowed the homesteads of our Saxon forefathers. Domesday-Book, compiled nearly eight centuries ago, contains the names of many places, still in existence, whose etymology may be traced to the elm. 'Toft' is a very ancient word for a homestead, and in the 'History of Craven,' by the learned Dr. Whitaker, it is said that 'a toft is so called from the small tufts of maple, elm, ash, and other wood with which dwelling-houses were anciently overhung:,' and he adds, that 'even now it is impossible to enter Craven without being struck with the isolated homesteads, surrounded by their little garths, and overhung with tufts of trees. These are the genuine tofts and crofts of our ancestors, with the substitution only of stone to the wooden crocks and thatched roofs of antiquity.' The ancient city of Ulm, in Bavaria, is said to derive its name from the elms in its vicinity.

The elm is at all seasons worthy of admiration. In early spring (though not annually) it throws out its dark crimson blossoms before the young green leaf has issued from the bud, and it is in full leaf earlier than many other trees. In summer the lights and shades of our ever-varying skies are most picturesquely reflected by its graceful masses of foliage. In autumn, when the time of its fading is near, the leaves of the elm, though not presenting very diversified hues, often assume their yellow livery at so early a period as to arrest the mind, and forcibly impress it with the fact that 'the harvest is past, the summer is ended.'
In winter, when seen against the clear sky, the elegant manner in which the spray of the branches is formed, and the lightness and elegance of the branchlets and twigs, are brought out with great effect; and not less beautiful is it when encrusted and feathered with the hoar-frost. Our cut will show that we have done no more than justly praise the form, and that “the trunk is so bold and picturesque in form, covered as it frequently is with huge excrescences; the limbs and branches are so free and graceful in their growth; and the foliage is so rich, without being leafy or clumpy as a whole; and the head is, generally, so finely massed, and yet so well broken, as to render it one of the noblest of park-trees.”

SOUTHERN ABORIGINALS OF SOUTH AMERICA.

[Concluded from page 34.]

The arts by which the Fuegians obtain food, shelter, and clothing are few and simple. Theirwigwams scarcely exclude the weather. Those of the Tekenera are formed by folding a piece of earth, touching one another, in a circle, and uniting in a real shape at the top. The side against which the prevailing wind beat is covered with more dry grass, bark, or skins. The other tribes make their wigwams in the bee-hive shape, with branches of trees stuck in the ground and bent together at the top. Their height from the ground is four or five feet; and the floor below, whose interior height is about five feet and a half; and the diameter is from two to four yards. Among the Chonos tribe, in Patagonia, huts were found of various shapes, and some of large dimensions, capable of containing fifty or sixty people. This tribe possesses the best canoes also. Some have been seen thirty feet long, and seven feet broad, made of planks oaken to a plume. One at Mongeham, near Doncaster, was 79 feet high, 14 feet in circumference at the ground, and contained 268 feet of timber. One at Mongeham, near Doncaster, was 79 feet high, 14 feet in circumference at the ground, and contained 268 feet of timber. The elm thrives in most soils, with the exception of moist clays and very light sands, but though requiring little attention and pruning, it is subject to occasional diseases, and is ravaged and destroyed by certain insects and grubs. It grows vigorously when all the branches are lopped and only a few of the topmost boughs are suffered to remain, but this mode of pruning of course greatly injures the picturesque character of the tree, though it is said to improve the timber; and lastly, the elm bears transplanted better than the other species of the genus. The size of some of the largest elms has been recorded. The Chipstead elm, in Kent, was 60 feet high, and contained 268 feet of timber. One at Mongewell, Oxfordshire, was 79 feet high, 14 feet in circumference at three feet from the ground, the diameter of the head 65 feet, and it contained 250 feet of solid timber. There is one at Wakefield, Yorkshire, which was 13 feet in circumference at the ground, and contained 250 feet of solid timber. At the former place the height of one tree, in 1837, was 88 feet, diameter at the trunk 6 feet, and of the head 73 feet; and at the same period a tree at Twickenham, one hundred and twenty years old, was 90 feet high, diameter of the trunk 94 feet, and of the head 60 feet. At Chiswick, near London, there is a large elm 80 feet high, diameter of the trunk 94 feet, and of the head 115 feet. In 1745 an elm was cut down at Chelsea, said to have been planted by Queen Elizabeth, which was 13 feet circumference at the ground and half as much at the height of 44 feet, and its height was 110 feet. There are also many fine specimens in Windsor Park, and the Long Walk is partly formed of them. We have instances on record of elms which have put forth leaves for more than three centuries, and it will continue to grow for a century or a century and a half in favourable situations; but the best time for felling is at the age of sixty or eighty years. Evelyn says that forty years are required to produce a large piece of timber; and that young trees in the climate of London will attain the height of 25 or 30 feet in ten years. The wood of the elm is remarkable for the manner in which it shrinks in drying, but when a proper period has been allowed for seasoning, it stands exposure to the sun without splitting, and is preferred to all other timber for water-pipes. The ship-builders use it for keels.
down of birds, very fine dry moss, or dried fungus. Whirling this tinder in the air when a spark has fallen upon it, the flame is soon kindled. The soil is not cultivated, and the vegetable productions which are eaten are few in number, consisting of a few berries, as the cranberry and the berry of the arbutus; also a fungus like the oak-apple, which grows on the birch-tree. With the exception of these spontaneous productions, and dead whales thrown occasionally upon the coast, the rest of their food must be obtained by their own perseverance, activity, and sagacity.

The migratory habits and the situations which they most frequently have been previously noticed. Their huts, we are told, are very commonly placed between projecting rocky points on sandy or stony beaches fronting small spaces of level land. The women, when at home, are employed in nursing the children, feeding the fire with dead-wood, making baskets, fishing-lines and necklaces, fetching water in small buckets made of birch-bark, which they of course manufacture themselves. Swings are made to amuse the children with ropes of seal-skin. The women also go out to catch small fish, to collect shell-fish, and to dive for sea-eggs. They take care of the canoes while the men are otherwise engaged, and use the paddle while their masters sit idle in the canoe. In some tribes the women do the hard work of life, if the brother be absent; in others it is their common lot. The men, however, are not idle. They procure the larger kind of fish, as the seal and porpoise, and go on hunting expeditions. While not thus engaged, they break or cut wood and bark for fuel, and for building their wigwams and canoes; but the pursuit of food is the constant object. They are廣告 to hunt—but it is generally, which come down from the high lands in winter to the pastures on the coast; and as the long legs of these animals disable them from escaping when the snow is deep, they are taken without much difficulty. Both seal and porpoises are spared from their canoes; also fish of fifteen or twenty pounds weight; the seal and porpoise being valued for the oil as well as for the flesh. The dog is considered a piece of meat in otter hunting; but except by hunger, only parts of this animal are eaten by the natives. Birds are pursued and killed with the sling, as well as the bow and arrow; the dogs are trained to catch birds on moonlight nights while roosting, and to surprise the larger birds when feeding; and also to drive the fish towards their masters on their fishing expeditions. The cliffs by which the fish fall are covered with ropes of seaweed; and ropes of seal-skin are made by which they descend the face of the cliff in search of them, as well as young birds, or seal which haunt caves that are inaccessible from the sea. Small fish, which constitute with shell-fish a large proportion of the food of the natives, are caught in great abundance in the cliffs by their means of preserving life. In Captain Fitzroy's narrative there is an account of a party of the natives who were in a famishing state, on which some of the tribe departed, observing that they would return in four 'sleeps' with a supply of food. On the fifth day they arrived in a state of great exhaustion, each man carrying two or three pieces of whale-blubber in a half putrid state, and which appeared as if it had been buried in the sand. A hole was made in each piece, through which the man carrying it inserted his head, and neck. These periods of severe suffering and distress occur when heavy gales prevent the launching of the canoes, and the rocks where they are anchored being inaccessible; also when the frost is severe and the snow is deep. It is under these circumstances that the pangs of hunger are appeased by human flesh, the oldest woman being the first victim. The conquerors in battle also feast on the vanquished.

A people who live in so miserable a state as the Fuegians, are necessarily under the dominion of a gloomy superstition. They never talk of the dead. Their evil spirit is described as "a great black man supposed to be always wandering about the woods and mountains, who is certain of knowing every word and every action, who cannot be escaped, and who influences the weather according to men's conduct." As is quite natural, dreams, signs, and omens exercise a great influence over them. The dead are carried out into the woods, placed in so miserable a state as the

The dead are carried out into the woods, placed upon broken boughs of trees, and covered with a great quantity of branches; but some of the tribes deposit their dead in caves. They seldom live to a great age, and the only medical care and security, instead of club law, and most of their mischiefs is caused by the absence of these blessings. However, when a dead whale is found, they bury portions in the sand; and when pressed by hunger, these stores are sometimes asked the cause, on which he said, "people bad, cry very much." Captain Fitzroy supposes that this outcry was devotional; but it might be a lament for the dead, as a similar howl, ending with a low growling noise, was heard at another time, which was ascertained to be occasioned by the fate of one of the men who had perished shortly before. The dead are carried out into the woods, placed upon broken boughs of trees, and covered with a great quantity of branches; but some of the tribes deposit their dead in caves. They seldom live to a great age, and the only medical care and security, instead of club law, and most of their mischiefs is caused by the absence of these blessings. However, when a dead whale is found, they bury portions in the sand; and when pressed by hunger, these stores are sometimes asked the cause, on which he said, "people bad, cry very much." Captain Fitzroy supposes that this outcry was devotional; but it might be a lament for the dead, as a similar howl, ending with a low growling noise, was heard at another time, which was ascertained to be occasioned by the fate of one of the men who had perished shortly before. The dead are carried out into the woods, placed upon broken boughs of trees, and covered with a great quantity of branches; but some of the tribes deposit their dead in caves. They seldom live to a great age, and the only medical care and security, instead of club law, and most of their mischiefs is caused by the absence of these blessings. However, when a dead whale is found, they bury portions in the sand; and when pressed by hunger, these stores are sometimes asked the cause, on which he said, "people bad, cry very much." Captain Fitzroy supposes that this outcry was devotional; but it might be a lament for the dead, as a similar howl, ending with a low growling noise, was heard at another time, which was ascertained to be occasioned by the fate of one of the men who had perished shortly before.
ing, he marries. The first step is to obtain the consent of the girl's parents, and he conciliates their good will by helping them to make a canoe, perhaps stealing one for them, or to prepare their sled or skiing-boards, and then having stolen a canoe for himself, he carries off his intended wife by stealth; or, if she is averse to the match, she hides herself in the woods; but this sociability in savage life does not usually last long. Both men and women display a good deal of affection for their children. The combined influence of a father in his family, of the aged, the most learning, and of the doctor-wizards over their fellows, and of the 'doctor-wizards' over the tribe, is the substitute for social government.

Language is another link which binds the individuals of a tribe into a loosely connected social state: but, according to Mr. Darwin, it scarcely deserves to be called articulate.

In 1830 Captain Fitzroy brought to England four natives of Tierra del Fuego; a girl, aged nine years; a boy, aged fourteen; and two young men, aged twenty and twenty-six, one of the latter of whom died of small-pox soon after reaching Plymouth. The remainder were placed with the master of the infants-school at Walthamstow, at the sole expense of Captain Fitzroy, where they remained from December, 1830, till January, 1834. They learn English, read, the alphabet, numbers, and the alphabet and grammar, writing their names, numbers, and simple sentences. They have a great interest in smith's or carpenter's work, and learned to make a small charcoal-stove. They were taught the use of common tools, and acquiring a slight knowledge of husbandry and gardening. The two younger Fuegians made some progress, but though the man took an interest in smith's or carpenter's work, and learned to estimate the value of animals, and the manner of taking things, yet they could not be made to understand their kind addressed them, and they remembered such words for each word in any sentence they were to return, was commanded by their kind addressed them, and they remembered such words for.

Mathew went out in the same ship, with the intention of remaining in Tierra del Fuego to teach the natives of this distant part of the globe are now made some progress, but though the man took an interest in smith's or carpenter's work, and learned to estimate the value of animals, and the manner of taking things, yet they could not be made to understand their kind addressed them, and they remembered such words for.

In this interval matters had not proceeded so comfortably. Canoes full of strangers to Jemmy's family had arrived, and Mathews's whole time had been taken up in watching and protecting his property. These strangers would stop for everything they saw, and become enraged when nothing was given to them. Some of them threatened his life, and a party would gather round him and tease him in every possible way, holding his head to the ground to show their contempt for his strength. Jemmy had been plundered even by his own family, and the garden was trampled all over. It was now determined that Mathews should be removed.

In March, 1834, Captain Fitzroy again visited Woollya. The place appeared deserted; the wigwams had apparently been uninhabited for some months; and only a few potatoes and turnips had sprung up in the neglected garden. In the course of an hour or two 'Jemmy' made his appearance, but the change which he had undergone was so great that Captain Fitzroy did not at first know him. Jemmy's portrait in 1833, and in 1834, given in the second volume, shows how the intelligent countenance and bearing had given way to the wild and neglected aspect of the savage. He spoke English as well as ever, and even his relations mixed broken English with their words. Captain Fitzroy says of Jemmy that 'he was naked, like his companions, except a bit of skin about his loins; his hair was long and matted, just like theirs; he was wretchedly thin, and his eyes were affected by smoke.' He had very nearly relapsed into his original wild state; and the only benefits which will probably result from this most benevolent scheme will be confined, as Captain Fitzroy seems to think, to the assistance and kind treatment which some shipwrecked seamen may receive from Jemmy Button's children; but even this is something. Tierra del Fuego is not an attractive scene for missionary enterprise, and the poor natives of this distant part of the globe are now left in the same hopeless state in which they have been for ages. They are not destitute of natural talent, which is for the most part displayed in the keen perception of common things, and the art of making weapons of bone and wood; and they have an extraordinary local knowledge, which one of the natives evinced by drawing an outline of the coast on the deck of the 'Beagle.' They are besides excellent mimics, and have a good memory. Mr. Darwin says 'they could repeat, with perfect correctness, each word in any sentence we addressed them, and they remembered such words for some time.'

THE DOMESTIC WINES OF THE AMERICANS.

(From a Correspondent.)

The domestic wines of America, without including such as are occasionally made for mere experiments, are birch and maple wine, which are furnished by the native forests of the country, and apple or cider wine.

There are in the American forests several varieties of the birch; but that from which the sap or juice is extracted, of which wine is made, is the black birch; but where that is scarce, the sap of the white, or of the yellow (so named from the colour of the bark), is substituted. Many of the trees attain a much larger size than birches do in this country, and in some places a considerable portion of the forest-trees belong to this family. The sap can therefore be easily procured, as it flows far more freely than even the maple sap. A good sized sugar-maple, when the sap flows most freely, will yield five or six gallons during the twenty-four hours; but rarely so much, unless there be more than one notch or auger-hole made for the sap to escape by: while a healthy birch, with a stem of eighteen or twenty inches in diameter, tapped in one place, will frequently yield twelve or fifteen gallons of sap during the twenty-four hours.

The sap of the black birch is nearly as sweet to the taste as maple-sap; but though it contains much saccharine matter, the inhabitants have never succeeded in manufacturing sugar from it. When procured for the purpose of making wine, this sweetness is sufficient to prevent the necessity of adding sugar. It is necessary,
however, to reduce the liquid by boiling; and the country-people who make this sort of wine boil down the sap at the rate of from ten or twelve gallons to one, or sometimes even less. A few hops are occasionally boiled in the sap, or a little of the inner bark of the sugar-maple-tree put into the liquid, to give it a flavouur; but in general the wine is a purely birch-wine, without any addition whatever to the boiled sap. While it is new and sweet it is not generally esteemed; for, besides the mawkish sweetness, it has a strong and rather bitter flavour of the birch; but by the end of the second or third year it usually becomes much more palatable, great care being necessary during this process, in order to prevent its becoming acetic acid; and great cleanliness is necessary during the process of boiling, in order to keep it of a pale and bright colour.

The maple-wine is made from the sap of the sugar-maple, and generally about the latter part of the season for making sugar; for when the buds of the maple-tree are about to burst, and snow is on the ground, the sap contains about a sixth part of the original quantity. When the frost is severe, I carried off by subsequent dropsy.—Letters from the Baltic.

months, or probably a year or two, reduced, by being submitted to the action of frost, to one-fourth or one-fifth of its original quantity. When the frost is severe, a barrel of cider is emptied into shallow vessels; and as ice forms on the surface of these vessels from day to day, it is removed, as consisting of the aqueous part only, the spirituous portion remaining behind. When the vessels are sufficiently shallow, a very few days of hard frost will complete the process; and then what is contained in the vessels, a dark brown liquid, is bottled off for use.

Although the Temperance Societies in America have greatly reduced the consumption of ardent spirits, to which those societies were formerly accustomed, the consumption of wine has increased. Beer is not interdicted by the more liberal portion of those societies; and of late years so much malt liquor has been patronised, that in many inland parts of the country ale is to be had at every tavern, where none was to be met with twelve or fifteen years ago.

The 'Peking Gazette.'—There exists throughout China but a single newspaper, which is published at Peking, and bears the title of 'King-paoou,' or 'Messanger of the Imperial Residence.' Neither in its form (which is that of a pamphlet) nor its contents does it bear a resemblance to the political journals of Europe or America. The supreme council of the empire, in which the ministers have seats, assemble in the capital at Peking. Every day, at an early hour, copies of the extracts on the subjects decided or examined on the previous evening by the emperors, are stuck upon a board in one of the courts of the palace. A collection of these extracts comprises the annals of the government, in which are to be found the materials for the history of the Chinese empire; hence all the government boards and public establishments are required to have copies made of all proceedings which have been under consideration, that they may be preserved, and so that the provincial boards receive these records through their post servants, whom they maintain in the capital for this sole object; but, in order that all the people of the empire may obtain a certain degree of acquaintance with the state and progress of public affairs, the extracts placarded are, with the permission of the government, printed at Peking entire, without changing a single word or omitting a single article. This is the 'Peking Gazette,' or newspaper of China, which comprises all the orders that have been committed to the approbation or examination of the emperor by his ministers at Peking, and by the different provincial authorities, as well as by the commanders of military corps. Appointment to posts, promotions, sentences, punishments, reports from different departments of the public service, the state of the legislative and judicial matters contained in the gazette, are made by imperial officers upon particular occurrences are brought by means of this paper to the knowledge of the world. Occasionally the provincial reports contain very interesting notices of physical phenomena. This gazette may be subscribed for by the year, or for an indefinite period, in which cases it is to be forwarded as soon as notice is given that it is no longer desired. The amount of the subscription is a liang (or tael) and a quarter (56, 4d.) per annum. Those who reside in the capital only have the advantage of receiving the gazette every day at a certain hour; as there is a regularly established post in China, the paper does not reach distant parts of the empire till very long after publication.—Asiatic Journal.
ABORIGINES OF AUSTRALIA.

It is not a century since the discovery of New Holland, or Australia, by Captain Cook, and for ages the aborigines had undisturbed possession of this vast territory, whose area is sixty times greater than that of England. They belong to two races, one the Malay, common to many of the islands north of Australia and of Polynesia; and the men of the second race, who have woolly hair, are considered as a branch of the African negroes; but in most other respects they differ from them. The natives of Malay origin are the superior race. Major Mitchell, who has explored fully a seventh part of Australia, estimates the native population spread over this portion of the country at less than six thousand. Proceeding along the coast from east to west, great uniformity of dialects is found; but in going from north to south there is often an entire difference in parts at no great distance from each other. Different tribes are found in succession along the courses of the principal rivers. On the Darling river, where fish and wild-fowl are tolerably abundant, the tribes remain almost stationary, at least the women and children, and some of the men, generally remain in one spot; but the tribes who do not live upon the coast or near the great rivers are necessarily migratory, as the pursuit of the opossum, the kangaroo, and the emu leads them over large tracts of country. As many as four hundred natives have been seen together in one encampment, reckoning three natives to each fire. Some of the tribes are remarkable for openness and frankness, while others are not to be trusted for a moment, and their countenances betray their treachery and implacability. A green branch borne in the hand is emblematic of peace, and their hostility is demonstrated by presenting a burning brand, by wild gestures and contortions, a furious dance, and by throwing up dust and spitting towards their opponents. In common with other uncivilized races, they possess great quickness of apprehension, a good memory, and a minute and accurate knowledge of localities; and Major Mitchell remarks that they never seem awkward, but in manners and general intelligence are superior to any white rustics he ever saw. Several natives who were sentenced at Sydney to work with the convict gangs were taught in about five months the art of stone-cutting and building, so as to be able to erect a small house; and they learned to read tolerably well in the same time. They sometimes become good shepherds. Our limits will only permit us to give an account of their most striking habits and customs.

Let us first give a picture of a native at a moment when he dreamt not of the white man being so near:—

"His hands were ready to seize, his teeth to eat, any living thing; his step, light and noiseless as that of a shadow, gave no intimation of his approach; his walk suggested the idea of a prowling beast of prey. Every little track or impression left on the earth by the lower animals caught his keen eye, but the trees overhead chiefly engaged his attention. Deep in the hollow heart of some of the upper branches was still hidden, as it seemed, the opossum on which he was to dine. The wind blew cold and keenly through the lofty trees, yet that brawny savage was entirely naked." Major Mitchell, who gives this account, startled him with a loud halloo, on which he retired with a light bounding step peculiar to uncivilized man, but which may be described as a sort of
running walk. And here is a sketch of an old woman, presenting a contrast such as we might expect to find.

She was "shortened and shrivelled with age, without clothing: one eye alone saw through the dim decay of nature—several large, fleshy exsences projected from the sides of her head like so many ears, and the jaw-bone of a white man showed through a gash on the side of her chin. The withered arms and hands, covered with earth by digging and scraping for the snakes and worms on which she fed, resembled the limbs and claws of a quadruped."

A girdle made of the wool of the opossum, with a sort of tail hanging down before and behind, is the claw-bone of a white man shown through a gash on the side of her chin. The withered arms and hands, covered with earth by digging and scraping for the snakes and worms on which she fed, resembled the limbs and claws of a quadruped.

The natives of Australia believe in a good and evil spirit, and have numerous superstitions and customs of a religious nature. At the age of puberty, the youth of the male sex pass through a period of probation in solitude, and have one of their front teeth knocked out by a sort of priest. This mutilation distinguishes the least ferocious tribes. Dances are connected with their
hostile demonstrations, either to express their defiance or to stimulate their warlike fervour. The ‘corrobory dance’ is an amusement partaking in a slight degree of the nature of a rude drama. It is thus described by Major Mitchell:—"This amusement always takes place at night, and by the light of blazing boughs. They dance to beaten time, accompanied by a song, stretching a skin over the knees, and thus using the tympanum in its rudest form. The dancers paint themselves white, in such remarkably varied ways, that no two individuals are at all alike. The surrounding darkness seems necessary to the effect of the whole, all these dances being more or less dramatic; the painted figures coming forward in mystic order from the obscurity of the back-ground, while the singers and beaters of time are invisible, have a highly theatrical effect.

Each dance seems most tastefully progressive, the movement being at first slow, and introduced by two persons displaying the most graceful motions both of arms and legs, while others one by one drop in, until each imperceptibly warms into the truly savage attitude of the ‘corrobory’ jump; the legs striding to the utmost, the head turned over one shoulder, the eyes glaring, and fixed with savage energy in one direction, the hands usually grasping waddies, boomerangs, or other warlike weapons. The jump now keeps time with each beat, and at each leap the dancer takes six inches to one side, all being in a connected line led by the first dancer. The line is doubled or tripled according to space and numbers; and this gives great effect, for when the front line jumps to the left, the second jumps to the right, the third to the left again, and so on, until the action acquires due intensity, when all simultaneously and suddenly stop. The excitement which this dance produces in the savage is very remarkable. However listless the individual, lying half asleep perhaps, as they usually are when not intent on game; set him to this dance, and he is fired with sudden energy, every nerve is strung to such a degree, that he is no longer to be recognised as the same individual, until he ceases to dance, and comes to you again."

### THE CONNECTION BETWEEN THE COLOUR AND THE ODOUR OF PLANTS.

Numerous as have been the investigations of naturalists respecting the growth and physiology of plants, there is one feature which, until the last few years, has scarcely met with the attention which it merits, viz., the connection between the colour and the odour of plants. Indeed the nature and source of odour generally have been but little investigated. The fragrance emitted by certain flowers is recognised as pleasing to the sense of smell, and as being different in different flowers; but beyond this point the information afforded us is of a very vague character. Within the last ten years, however, experiments have been made on this subject which merit a brief notice. The researches of Dr. Stark, while attending the anatomical and physiologist, have thrown a little yellow chromogen; 3, In yellow flowers the yellow chromule varied in its character from the green to the yellow, but no red chromogen; 4, Blue flowers, orange-coloured flowers, and purple flowers, all contained both the red and the yellow chromogens, together with that particular tint of chromule which corresponds with their recognised colours; 5, Experiments made on various different parts of plants gave results similar to the above in respect of colour.

Other experiments on the same subject were made about the same time in Germany by Dr. Macquart, whose results differ so much from those obtained by Dr. Hope. Dr. Macquart thinks that all flower-leaves are originally green in the bud, and that they acquire their subsequent colour by certain changes in the green colouring matter. This substance is called chlorophyll or chlorophyre, and forms the colouring-matter of green leaves throughout their growth. The changes in this chlorophyll, by which green buds assume some other colour, Macquart states to be as follows:—That when water or its elements are removed from the chlorophyre, the colouring-matter for the blue, violet, and red flowers is produced; but that the addition of water or its elements produces the colouring-matter for yellow flowers.

In investigating the steps by which the green chlorophyll of the original bud assumes the colour of some other tinct, he found that the transition from green to yellow is made without the intervention of any other tint; that red flowers become white in bud after losing the green tint, and before assuming that of red; that blue flowers go through the gradation of green, white, red, and blue, in bud. There are certain discrepancies in the results of these two series of experiments, which show that the inquiry is yet in its infancy. Both series, however, agree in this, that yellow flowers contain a colouring principle of a peculiar kind which places them in a class different from most other coloured flowers.

Without regarding the actual cause of colour, experiments have been made within a few years to ascertain the relation, if any, which exists between colour and odour in plants as well as in other bodies. The ‘Philosophical Transactions’ for 1833 afford some interesting details on this point. Dr. Stark, while attending the anatomical and physiologist, has been able to show that during the winter session 1830-1, perceived that when he wore a black-cloth dress his garments acquired a very disagreeable odour in the anatomical room, which they retained for a considerable time, whereas when he wore an olive-coloured dress no such inconvenience was experienced. The circumstance appeared to Dr.

K 2
Stark worthy of investigation; and he accordingly exposed small quantities of differently coloured substances to the action of odoriferous bodies, with a view to determine whether colour influenced the absorption of the odoriferous principle, whatever that may be. A small quantity of black wool, and an equal quantity of white, were exposed for six hours to the action of camphor, in a dark place, when it was found that the black acquired a much more powerful odour of camphor than the white. The experiment was repeated, but with the substitution of assafoetida for camphor; and in twenty-four hours the black wool had imbibed an offensive odour, whereas the white was almost inodorous. To determine whether vegetable substances gave similar results, Dr. Stark took small quantities of black and white cotton, and exposed them similarly to the action of camphor and of assafoetida; and in both cases the black cotton acquired more odour than the white.

After a while Dr. Stark extended his investigations to other colours. He inclosed equal weights of black, red, and white wool in a drawer with assafoetida, and similar wool in another drawer with camphor. In two other drawers he exposed black, red, and white cotton, in similar quantities, to the action of the same two substances; and in all four cases he found that the black acquired the greatest amount of odour, the red next, and the white scarcely any. The experiment was next repeated with silk, instead of wool or cotton, and with exactly similar results. More extended experiments in the range of colours was then selected, and experimented on in the following manner:—A piece of assafoetida was placed in a darkened spot, and around it were ranged six small pieces of wool, respectively coloured black, blue, green, orange, red, and yellow, placed circuitously, or surrounding the assafoetida or one another. At the end of twenty-four hours they were found to have imbibed odour in the following order as to intensity, black, blue, green, orange, red, yellow, white, the black being most affected, and the white least. This experiment was repeated in six different forms, the coloured substances being wool, cotton, and silk, and the odoriferous substances assafoetida and camphor; and in every case the most powerful odour was acquired in the order given above, although wool imbibed more than cotton of the same colour.

Dr. Stark found that these phenomena were capable of being exhibited by the balance, as well as by the organ of smell; for he ascertained that if the coloured substances were exposed to the action of odoriferous bodies, and then exposed to the action of camphor slowly evaporated by heat, the coloured substance acquired an increase in weight; and that this increase was greater when the colour was black, and less when white, than with any other colour, the order being generally black, blue, brown, red, green, yellow, white. In these experiments Dr. Stark the comparative odours of the differently-coloured substances were determined by a great number of persons, in order to avoid error as much as possible; and the results stated seem worthy of attention.

In another extensive series of observations made by Schübler and Köhler in Tubingen, about ten years ago, the relation of colour and odour is attended to, more especially in reference to plants. These experimentalists examined the relations of the flowers of more than four thousand plants belonging to twenty-seven different families, of which twenty were of that kind determined by botanists as dicotyledonous, and the other seven monocotyledonous, implying respectively 'double seed-lobed' and 'single seed-lobed.' In most of the families all the available genera and species were examined; and in the others the most important. There were two points to be determined: 1st, Out of 4200 species of flowers, how many there were of each colour; and, 2nd, how many of each colour were odorous; and the results gave—

<table>
<thead>
<tr>
<th>Coloured Species</th>
<th>Odoriferous Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>1194</td>
</tr>
<tr>
<td>Red</td>
<td>922</td>
</tr>
<tr>
<td>Yellow</td>
<td>251</td>
</tr>
<tr>
<td>Blue</td>
<td>504</td>
</tr>
<tr>
<td>Violet</td>
<td>308</td>
</tr>
<tr>
<td>Green</td>
<td>153</td>
</tr>
<tr>
<td>Orange</td>
<td>56</td>
</tr>
<tr>
<td>Brown</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>4200</td>
</tr>
</tbody>
</table>

From this it appears that white is the most extensively distributed colour; that the decided colours, red, yellow, and blue, are much more plentiful than violet, green, orange, or brown; red and yellow being nearly equal, and not much less numerous than white. It appears also that about one-tenth part of the whole number are odorous; the white, which are the most plentiful, being also the most odoriferous; and among the other colours the red flowers have the greatest tendency, and the blue the least, to the formation of odoriferous substances.

An attempt was then made to separate agreeable from disagreeable odours; but this distinction we should think a vague one, because an odour which would be pleasant to one person might be unpleasant to another. According to the sensation of the experimentalists, however, it was found that white flowers are not only more generally odoriferous than others, but their odour is also more frequently agreeable than that of others; for in one hundred white-flowering plants there were on an average fifteen with agreeable odours, and only one disagreeable; whereas in one hundred variously-coloured plants the agreeably odorous were to the disagreeable only in the ratio of five to one, instead of fifteen to one.

A further examination was made, in which the difference between light and dark tints was taken into account; a light tint being regarded as possessing a good deal of the character of a white flower; and therefore designated, perhaps erroneously, as having a considerable share of white mixed with it. Very extensive tables of classification were then formed, in which the prevailing colour of the flower is noted; then the distinctions of light, medium, and dark tints; and lastly, the number of odoriferous species in each. Of these tables we can only give the last, which is a summing-up of the whole:

<table>
<thead>
<tr>
<th>Intensity of Colour in Flowers</th>
<th>Mean number of Odoriferous Species in 100, according to the prevailing colour of the flowers.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Red.</td>
</tr>
<tr>
<td>With 69-12 per cent. white (dark)</td>
<td>5-66</td>
</tr>
<tr>
<td>With 57-75 per cent. white (medium)</td>
<td>13-03</td>
</tr>
<tr>
<td>With 70-100 per cent. white (light)</td>
<td>28-99</td>
</tr>
</tbody>
</table>

It will here be seen that, omitting the colours of less frequent occurrence, the odoriferous qualities are possessed in the order red, yellow, violet, green, blue, after white, as the principal; and also that, taking any one colour, there are more odoriferous species of a light than a dark shade. In that order, the relation being expressed by saying that there is a larger per centage of white in the former than in the latter. The most odoriferous combination entered in the table is the red largely diluted with white, or light red, in which is probably included all the varieties of "rose-colour."
No odoriferous species are entered among the very dark violets or very dark greens.

It might appear at first thought that some of these results are inconsistent with those obtained by Dr. Stark; but it must be remembered that in one case we are treating of the natural odour of flowers, and in the other of odoriferous matters driven, as it were, into the coloured substance from without. We may find hereafter that all the results are consistent. At any rate the subject is well worth further investigation on the part of those who have time and opportunities for pursuing it.

THE PIKE.

Although the pike (Esox lucius) is now very common in most of our rivers and lakes, it is not supposed to be indigenous to this country, and was considered a great rarity for many years after its introduction. The pike is much esteemed as an article of food: large quantities are taken in the north of Europe, and dried for winter consumption. Horsea Mere and Heigham Sounds, in Norfolk, are the places most celebrated in England for the quantity and excellent quality of these fish caught there. The pike grows rapidly, and sometimes attains an enormous size. Some have occasionally been found in the lakes of Scotland and Ireland that have weighed upwards of seventy pounds. It is supposed also that the pike is the longest lived of any fresh-water fish. Izaak Walton tells us that Sir Francis Bacon "computes it to be not usually above forty years; and others think it to be not above ten years; and yet Gesner mentions a pike taken in Swedeland, in the year 1449, with a ring about his neck, declaring he was put into that pond by Frederic II, more than two hundred years before he was last taken, as by the inscription on that ring, being Greek, was interpreted by the then bishop of Worms." Walton then goes on to say "that it is observed, that the old or very great pike have in them more of state than goodness; the smaller or middle-sized pikes being, by the most and choicest palates, observed to be the best meat." The pike, being the largest fresh-water fish, eats in proportion to its size; it "has always been," says Mr. Yarrell, "remarkable for extraordinary voracity." "Eight pike, of about five pounds weight each, consumed nearly eight hundred gudgeons in three weeks; and the appetite of one of these pike," says Mr. Jesse, "was almost insatiable. One morning I threw to him, one after another, five roach, each about four inches in length: he swallowed four of them, and kept the fifth in his mouth for about a quarter of an hour, when it also disappeared."

The pike is considered to be the most expensive fish to maintain, in consequence of the immense quantities of food that it consumes and the extreme rapidity of its digestion. Izaak Walton says: "All pike that live long prove chargeable to their keepers, because their life is maintained by the death of so many other fish, even those of their own kind; which has made him by some writers to be called the tyrant of the rivers, or the fresh-water wolf, by reason of his bold, greedy, devouring disposition; which is so keen, that, as Gesner relates, a man going to a pond, where it seems a pike had devoured all the fish, to water his
mule, had a pike bit his mule by the lips, to which the pike hung so fast that the mule drew him out of the water; and by that accident the owner of the mule angled out the pike. And the same Gesner observes that a maid in Poland had a pike bit her by the foot, as she was wading through a pond. And I have heard the like of a woman in Killingworth pond, not far from Coventry. But I have been assured by my friend Mr. Seagrave, that keeps tame otters, that he hath known a pike, in extreme hunger, fight with one of his otters for a carp that the otter had caught, and was bringing it out of the water. A curious instance of the pike's voracity is recorded by Mr. Bowler, in his 'Art of Angling':—"My father caught a pike in Barn-Meer (a large standing water in Cheshire), was an ell long, and weighed thirty-five pounds, which he brought to the Lord Cholmondeley; his lordship ordered it to be turned into a canal in the garden, wherein were abundance of several sorts of fish. About twelve months after, his lordship drained the canal, and found that this overgrown pike had devoured all the fish, except one large carp that weighed between nine and ten pounds, and that was bitten in several places. The pike was then put into the canal again, together with abundance of fish with him to feed upon; but he devoured them like a raven. The Irish name for the pike is curragh, and the Welsh coracles, which were constructed of wicker-work covered with hides. The Irish name curroch, and the Welsh corregyl, probably point to the use of similar boats in ancient coracles of our ancestors were seen on the British rivers at the time of Julius Caesar's invasion; and were constructed of wicker-work covered with hides. The boats or canoes of rude nations bear strong marks of resemblance one to another, not only in different parts of the earth, but in different ages. The reason for this is a very obvious one, viz., that the materials out of which a hollow shell, capable of floating on water, might be constructed, are within the reach of most infant nations, such as a tree to be hollowed within, or reeds to be twisted together and covered with a skin. The ancient Britons used boats or canoes belonging to both these classes. The coracles of our ancestors were seen on the British rivers at the time of Julius Caesar's invasion; and were constructed of wicker-work covered with hides. The Irish name curroch, and the Welsh corregyl, probably point to the use of similar boats in Ireland and Wales at the present day; for Dr. Southey remarks, in his 'Lives of the British Admirals,' that 'Coracles thus made, differing only in the material with which they are coated, and carrying only a single person, are still used upon the Severn, and in most of the Welsh rivers. They are so small and light, that when the fisherman lands he takes his boat out of the water and bears it home upon his back. In the management of such slight and unsightly vessels great dexterity must have been acquired, especially in a climate so uncertain and in such stormy seas as ours.'

That the Britons were acquainted with the mode of constructing boats, or rather canoes, from the hollowed trunks of trees, many evidences remain to show. In an island called Staffa, in the Sound of Mull, an ancient canoe was dug up in the year 1756, with a paddle near it; the canoe was about seven feet long, and
dilated to a considerable breadth at one end. Another canoe, hollowed out of a solid tree, was seen by Mr. Pennant near Kilbllain; it was about eight feet long by eleven inches deep. In the year 1720 several canoes of similar construction were dug up in the marshes of the river Medway, above Maidstone, one of which was still in such a state of preservation as to be used as a boat for some time afterwards. On draining Martine Muir, or Marton Lake, in Lancashire, some years ago, there were found, embedded in the bottom of the lake, eight canoes, each made of a single tree. The oak of which these several canoes were made was found on examination to be remarkable for the free grain of the timber; and a number of ancient mili men and carpenters have expressed their opinion that the oak was of foreign growth, and the produce of a warmer country. To this opinion Dr. Southey objects, "that the canoes could not have been brought there from any warmer country seems certain; and if any inference can be drawn from the grain of the wood, as indicating its growth in a warmer climate, it seems to be that these canoes were made when the climate of this island was warm enough for elephants, hyenas, tigers, hippopotamuses, and other inhabitants of southern countries whose remains have been brought to light here."

The most favourable opportunity for examining the canoes of the ancient Britons is afforded by the specimen now deposited in the British Museum, and which was dug up in Sussex about seven years ago. A full description of this canoe, and of the place where it was found, has been published in the 'Archæologia,' from the pen of Mr. Phillips; and from this account we shall borrow a few particulars.

A full windward lean over the upper gunwale, thrust their paddles deep into the wave, apparently catch the water and force it under the canoe, and by this action not only regain an equilibrium, but give their bark a vigorous impulse forward. Other tribes of Indians in the same locality, but accustomed to the regular use of canoes, adopt a very simple and primitive plan of providing a temporary bark: they procure the skin of some animal which they may have shot, extend it out flat, fasten sticks across from side to side in different parts, and place it on the surface of the water: the sticks prevent the sides from collapsing; and the skin, by sinking or bending in the central part under the weight of the rower, forms a recess or hollow in which he can sit.

Instead of hollowed trunks of trees, many rude nations make canoes, or rather rafts, of several solid trunks laid side by side, and fastened together. Such is the *balsa* of South America, a tree resembling the laurel, but the logs of a fallen tree, was brought to light. Eleven horses were required to drag the canoe from its muddy bed; and it was then found to be a hollowed oak trunk, thirty-five feet long, about two deep, and four and a half wide, the thickness of the sides and bottom being generally about four or five inches. There are three bars left at the bottom at different distances from each other, and from the ends, which seem to have served the double purpose of strengthening the bottom and giving firm footing to those who worked the canoe in the water: they are too low and narrow to have served for seats. After stating various reasons for supposing that this canoe was made by the ancient Britons, and that it had lain undiscovered in that quiet part of the country for the intermediate ages, Mr. Phillips remarks, "That in some very early period they (the ancient Britons) should have recourse to the mode in which the canoe, the subject of this paper, was made, to enable them to float upon their rivers for various purposes, is not recorded in their imperfect history; but there have been indications in that quiet part of the country of the like invention by many other people in a similar degree of civilization; and it is adverse to reason to suppose that it should ever be done after the use of iron tools in dividing trees into planks, and the advantage of constructing vessels with wood so divided, became known and practised." To those readers who may not have seen this canoe in the British Museum, to which it was presented by the nobleman, the Earl of Egremont, on whose estate it was found, it may not perhaps be inappropriate to mention that the canoe is placed near the outer entrance from Great Russell Street, under the eastern arcade in the open quadrangle or court.

In many parts of the world at the present day canoes hollowed out of trunks of trees form the recognised boats of the natives. There is a tribe of Indians on the banks of the river Colombia in America who live almost wholly by fishing, and the canoes which they make for this purpose show the following character: they are upwards of fifty feet in length, cut out of a single tree, either fir or white cedar, and capable of carrying thirty persons each; they have cross-pieces from side to side about three inches thick, and the gunwale of the canoe curves outwards, so as to throw off the surges of the water. In managing these canoes the Indians kneel two and two along the bottom, sitting on their heels, and paddling paddles from four to five feet long, while one sits in the stern and steer with a paddle of the same kind. The fearless unconcern with which the Indians manage these canoes, not only in moderately swift rivers, but even in boisterous seas, seems to be very striking. Should one canoe upon its side and endanger its overturn, those to the south of the banks of the river Colombia in America who live almost wholly by fishing, and the canoes which they make for this purpose show the following character: they are upwards of fifty feet in length, cut out of a single tree, either fir or white cedar, and capable of carrying thirty persons each; they have cross-pieces from side to side about three inches thick, and the gunwale of the canoe curves outwards, so as to throw off the surges of the water. In managing these canoes the Indians kneel two and two along the bottom, sitting on their heels, and paddling paddles from four to five feet long, while one sits in the stern and steer with a paddle of the same kind. The fearless unconcern with which the Indians manage these canoes, not only in moderately swift rivers, but even in boisterous seas, seems to be very striking. Should one canoe upon its side and endanger its overturn, those to the south of the
sank down by the roadside completely exhausted, and be partly mortified. He tossed off gradually in the horse again escaped from her. The place where the course of the succeeding fortnight appeared to have slept but little, and her sufferings from it was imagined that she would ultimately be rising position she remained until the morning of the 10th. During this time, from her accurate account, it appears to have slept but little, and her sufferings from cold and hunger were, as may be imagined, most intense. For the first two or three days she made several ineffectual attempts to free herself from her miserable captivity; but latterly her strength so utterly failed her, that she was obliged passively to resign herself to her melancholy fate. As she had not been discovered, and completely she was covered in, she had recourse to the expedient of raising a flag as a signal of distress: this she effected by attaching her handkerchief to a stick and thrusting it through a small aperture which she observed in the snow above her head, and this ultimately proved the means of her rescue. She was frequently tantalized by hearing most distinctly the sound of carriages on the road near her, the different cries of the animals in the fields around, and the bells of the neighbouring villages. Passengers passed by her so close, that she could plainly overhear their conversation, although her loudest shouts were unsuccessful in attracting their attention. She once endeavoured to obtain some comfort from her snuff-box, but as she found that a pinch of snuff did not yield her the usual gratification, and she felt pain and difficulty in raising her hand to her head, she did not again try it. Towards the latter end of her imprisonment, she placed her two wedding rings, with the little money she had in her pocket, in a small box which she happened to have with her, thinking they would thus be safer, and less likely to be overlooked, if she died before she was discovered. On Friday the 8th, the sixth day of her confinement, a shaw having taken place, the snow around her began to melt, and the before-mentioned aperture enlarged so much as to hold out hopes to her of being able to effect her escape; but on trial, she found she had not sufficient strength to take advantage of this means of extricating herself from her dreary prison. It was about this time that she began to despair of ever seeing the light again, and her bones became so much weakened that she could not have survived many more hours in this state. It was on Sunday, the 10th, that a young farmer, happening to pass near the hedge, observed the handkerchief which she had attached to the stick, and on examining the spot, discovered the opening in the snow. He was seized to look in by hearing sounds issuing from within, and to his astonishment clearly distinguished a female form, which he immediately recognised as that of Elizabeth Woodcock, whom he knew to have been missing for some time. He called two men to his assistance, and with their help succeeded in releasing her. She was so perfectly sensible as to know her deliverers by their voices, and to call them by their names. Her husband and friends were sent for, and arrived with a cart to convey her to her home. At her own request, she had some brandy and biscuit given to her, which seemed to restore her greatly, but she fainted away on being lifted into the cart.

It appears that when her horse returned home, her husband, being alarmed at some meteoric appearance, became so restive that she was unable to make the necessary efforts to extricate herself in consequence of the stiffness of her clothes and the benumbed state of her limbs; and in this distressing position she remained until the morning of the 10th. During this time, from her accurate account, it appears to have slept but little, and her sufferings from cold and hunger were, as may be imagined, most intense. For the first two or three days she made several ineffectual attempts to free herself from her miserable captivity; but latterly her strength so utterly failed her, that she was obliged passively to resign herself to her melancholy fate. As she had not been discovered, and completely she was covered in, she had recourse to the expedient of raising a flag as a signal of distress: this she effected by attaching her handkerchief to a stick and thrusting it through a small aperture which she observed in the snow above her head, and this ultimately proved the means of her rescue. She was frequently tantalized by hearing most distinctly the sound of carriages on the road near her, the different cries of
POST TRAVELLING IN RUSSIA.

Turnpike-roads and railways have for a long time rendered travelling in England so safe, rapid, and pleasant, that scarcely an individual now living has any knowledge but from books of a time when many parts of his own country were almost impassable. If, however, he travels, he is, as it were, thrown back about a century; for though on the Continent there are now some lines of railway equal to our own, yet any divergence from these lines brings him to the village roads and tracks over unclosed commons, of which he has previously only read with a half incredulous belief. The nature of the country, the climate, and the degree of civilization in the southern provinces of Russia make the transition from ease and comfort to endurance and strenuous effort the more striking and effective; the elegant chariot, the commodious barouche, and the sprightly looking gig all disappear; while the sledge, the telega, the droschky, and the wagon become their substitutes. Of one of the modes of conveyance we have given a representation at the head of this article, and shall avail ourselves of the lively and picturesque descriptions of two recent travellers to perfect the idea of the nature of travelling in the southern part of the Russian empire.

The first of these travellers, Count Demidoff, a Russian nobleman residing at Paris, proceeded in 1837 on a tour to the southern provinces and the Crimea. After descending the Danube, he with his attendants entered Wallachia at Giurjevo. After more than three hours of effort and persuasion, they succeeded in getting together all the post-horses of the place in an inclosure, as they live in the open air. They selected twenty-four, but then found there were but two carriages. The horses were of a small size, slender, not highly-bred, but possessing singular vivacity and energy, and running with remarkable swiftness. Their harness is very simple: two cords, which serve as traces, are united by a band over the breast; another smaller cord like a halter, and without a bit, is passed around the head, and they are not shod; the action of the animal is thus entirely free. When, on a journey, these horses appear fatigued, the postilions descend, rub their eyes and pull their ears, persuaded that this will refresh and relieve them. Twelve of these coursers were attached to each of the carriages. All at once the animals, excited by the piercing shout of the postilions (a sort of half-naked savages), rushed with the travellers across plains intersected with ravines, rivulets, and bottomless marshes, and brought them the same evening to Bukharest, about twenty leagues. But this is a nobleman travelling post, and even here the dangers are not small. The plain between Giurjevo and Bukharest is traversed by numerous ravines, which, after the heavy rains, become dangerous bogs; more than once were their heavy carriages fixed in the miry swamps, where the road was merely carried across on branches of trees thrown across. But Wallachia is nominally independent of Russia; we will therefore see the Count again in the telega, the rude and rapid vehicle of the Crimea. The telega, he says, is not worse than the Wallachian vehicle. You are more at ease upon the litter, which is not spared in filling up the little box on which the traveller sits; two of whom are able, with care, to seat themselves on the mass of cloaks and other coverings which are heaped up in this trough to supply the want of a raised seat, and they thus afford each other a helping shoulder in passing rugged spots in their rapid progress, where the telega actually leaps as it is dragged forward by the two vigorous steeds. In front, with no other seat than a narrow board, sits the driver, who talks to the horses without ceasing. In front of the pole is suspended an
iron bell, which serves to announce their arrival to a post station, and effectually reminds the traveller that sleep would be dangerous on such a post-road. If no one is in attendance, the bell is silenced from respect to the ears of the citizens. It is in this rude vehicle that innumerable travellers, officers, agents, couriers, government functionaries, are continually traversing the empire, galloping night and day, without any other shelter than a cloak;—a cloak against the sun, against the rain, against the dust, against the dirt, against you to judge," says the Count, "with what a constitution he must be endowed who can support this infernal joltling." To this is to be added the delays occasioned by the breaking or submerging of the vehicle, both of which the Count experienced; as also, in a few hours' travelling, ten 'chocs de force,' by which the driver was unseated.

Our next extract is from the work of a lady, 'A Residence on the Shores of the Baltic,' describing her journey from Petersburg to Revel in Estonia. She leaves the former place at six in the afternoon of the 19th of November, a delay until daybreak being deemed highly hazardous. Anton, on the box, and myself, loaded with as many clothes as a southlander would draw over them. All my wardrobe had been doubled and trebled, and even then my friends shook their heads and feared I was too thinly clad. Thus we sallied forth into the wild waste of darkness and snow in which Petersburg lay, travelling with four post-horses but slowly through the unsound snowed-up roads, which were nevertheless not in the condition to admit of a sledge. Near midnight I alighted at the second post-house from Petersburg, the stages being on the average twenty-five wersts long, with four wersts to three miles. It was a fine building outwardly, but otherwise a mere whitened sepulchre. Here the superintendent of the post-stables, not being able to settle matters with Anton to their mutual satisfaction, was pleased to do it by an apothegm in a commanding gesture, poured forth a torrent of words of the utmost melody and expression. He was a perfect patriarch; his fresh sheepskin caftan and rich flowing beard curled round a head of the loftiest Vandyke character, unbaring, as he spoke, a set of even gleaming teeth, and lighted to advantage by a flaring lamp which hung above. I was in no hurry to interrupt him. Finding his eloquence not to the purpose he wanted, he left me with fresh gestures of the grandest courtesy to attack my obdurate servant, who loved copecks better than he did the picturesqueness.

Reseated with fresh horses and lulled by the musical jingle of our post-bells, I dozed with tolerable comfort during the night, and opened my eyes with daybreak to a perfect Esquimaux landscape; boundless flats of snow, low hovels of wood, and peasants gliding noiselessly past on their tiny sledges.

At twelve we reached Jamburg; an empty rambling town of large crown-barrack buildings and miserable little houses, with bare earth for post-beds. Quentin Matsys looking ahead, peeping at the equipage through the dull double glass. Here all restless doubts relative to the existence of a bridge were to terminate, and in a fever of anxiety I descended a hill which led to the river Luga. There it lay before me, broad, rapid, and dark; great masses of ice sulkily jostling each other down its current; but bridge—none at all. My heart sunk. Jamburg was but little inviting for a fortunet's residence, when, upon inquiry, a ferry was told to be put about, but with greater risk at every transport; and this would have cost in a few hours. Peasants with their carts and cattle stood on the bank awaiting their turn; and after much delay, and a profuse exchange of 'chorts' (literally, 'devil'), in which these Russians are most liberal, and which seems destined to be the first word I retain, our promiscuous ferry-men, with his laden boats, thronged through the stiffening ice, and at length touched the opposite shores. Here, having abandoned our old horses on the other side, Anton went off to search for fresh ones, and I was left sitting in the carriage for above an hour, among a set of swearing merry beings, who seemed bent alternately on quarrelling and laughing. The banks of the Luga are very pretty, though desolate; high ridges and a scanty vegetation creeping among them. When fresh horses arrived, their first task was to drag us up a hill of unusual steepness, whence as far as Narva was one uninterrupted plain. In Narva, which I reached about five o'clock, after a little difficulty we found the house to which I had been recommended by a friend, a rambling edifice of unpainted wood, all on the ground floor, and I entered it in company of various female shapes receding before me in the same proportion as I advanced, until having gained the apartment conventionally dedicated to the ceremony of reception, they all faced about, and came bowing and currying forward to receive me.

She became ill on her journey, and the hospitality she received, though cold, was oppressive, and too inquisitive to be agreeable. In defiance, therefore, of entreaties and forbodings, she started again, and in a short time "had entered Estonia: the landscape was undulating and wooded, and towards evening a high line of ocean-horizon, and a faint sound of waves, showed me we were skipping a cliff of considerable eminence. The appearance of our horses also kept pace with the improved condition of the country. They were beautiful sleek animals, small and graceful, sometimes four cream-colours, sometimes black, who started at fire, never abated their speed, and pawed the ground with impatience when the five and twenty wersts were run. How they were harnessed, or how the animals were managed, I could not discover, but a strange rag which danced about them, was quite an enigma. No less so the manoeuvre, more puzzling than any that innumerable travellers, officers, agents, couriers, government functionaries, are continually traversing and a profligate exchange of 'tchorts' (literally, devil'), in which these Russians are most liberal, and which seems destined to be the first word I retain, our promiscuous ferry-men, with his laden boats, thronged through the stiffening ice, and at length touched the opposite shores. Here, having abandoned our old horses on the other side, Anton went off to search for fresh ones, and I was left sitting in the carriage for above an hour, among a set of swearing merry beings, who seemed bent alternately on quarrelling and laughing. The banks of the Luga are very pretty, though desolate; high ridges and a scanty vegetation creeping among them. When fresh horses arrived, their first task was to drag us up a hill of unusual steepness, whence as far as Narva was one uninterrupted plain. In Narva, which I reached about five o'clock, after a little difficulty we found the house to which I had been recommended by a friend, a rambling edifice of unpainted wood, all on the ground floor, and I entered it in company of various female shapes receding before me in the same proportion as I advanced, until having gained the apartment conventionally dedicated to the ceremony of reception, they all faced about, and came bowing and currying forward to receive me."
Anton, nestling his head into the depths of his furs, sat before me like a pillar of salt. I felt my warmth gradually ebbing away, my breath congealed on my face, eyelashes and eyebrows hung in fringes of icicles, and a tell-tale tear of anxiety froze on my cheek. How severely did I reproach myself for having proceeded and exposed horses to most inclemency. Meanwhile we were traversing an open plain skirted by forests, and from time to time the silence of the night was broken by a moaning, snarling, drawn out cry, which fell dismally on the ear. I listened in vain conjecture, when a piercing whine within one hundred yards of us made me lean forward, and Anton, remarking the movement, composedly articulated 

"Volki" (wolves). Had the word been less similar, I believe I should have sprung to the conclusion, and chilling still colder at these evidences of a savage neighbourhood, of which we seemed the only human occupants, I longed more impatiently than ever for the friendly dwellings of man. At length we reached the station-house, and, grown less dainty, I entered instantly, and stumbled over a peasant on the floor, who, rising stupid with sleep, drew a green long whip, with which he struck me thus into my hand, and then, passing on through a room where lay two military men stretched on leather benches, and another shapeless mass on the floor, as unconcernedly as if they had been so many slumbering infants, I penetrated, under Anton's guidance, to an untenanted room beyond. Here my brisk attendant, who seemed most tenderly solicitous for this trampled hanger, warmed my carriage-cushions at the stove, and then disposing them as he deemed most temptingly on the wretched sofa, left me literally to repose. For, oppressed with cold and fatigue of mind and body, sleep fell instantly upon me.

After a short repose she awoke, and again resumed her journey. "Again our bells jingled more cheerily than they ever had before. The fog vanished, the sun rose cloudless, and groves of birch-trees dropped gracefully beneath thin veils of glistening hoar-frost, hanging like fairies in tissue robes among them, "While every shrub and every blade of grass, And every pointed thorn seemed'd wrought in glass."

And the next passage brings her to the close of the long and toilsome journey, which she has so animatedly described.

"The country was now one monotonous plain of snow, broken only by the black and white worst-posts, and by heaps of stones placed at distances to indicate the line of road. And evening gathered quickly round us, but still my eyes refused to rest, and soon they spied a high line of distant ocean, and then, dim and indistinct, appeared spires and towers, their utmost points tipped with the last reflection of the departing sun. This was Revel. I felt my eyes fill and my face glow. What would I not have given for a friend—a servant— a child—a ducne—the meanest creature breathing to whom I could have uttered the words that seemed to choke me! But a snow-storm swept the vision away, and all was gloomy darkness. We now descended a steep hill, and scattered houses lay thick along the road, and I sat leaning forward, and watching like one who, returned to his native home, seeks some well-known token at every turn. But what or who had I in this strange land but one object, herself a home, who dreamed not of the fevered heart that was hurry-
or more, it was very possible that those who governed them might enter into transactions of which he was not cognizant. The armour had been sent to the Soldan, but the king declared that the remaining property should be restored to the children. Long before, however, followed between these and the unjust possessors of it; but in 1463, Louis XI., by a formal decree, testified as to the inequity of the prosecution against Jaques Caur, as resulting only from the violence of Antony Chabonnes; and put Geoffrey Caur, the null promises of which he had received, into the metropolis. The rank of the most dangerous portion of the classes dangerous—those not "to the manner born," but who in their fall from purer regions had brought with them the feets of some passengers, and a search being instituted, the unfortunate man found himself surrounded by liabilities which he had incurred for the service of the state.

After two years of imprisonment, he was led to a scaffold nearly in a state of nudity, and, with a torch in his hand, compelled to do penance for his imaginary crimes. From prison he wandered, hoping to find some remains of his former fast traffic; but everywhere his vessels had been seized. He took refuge in a monastery belonging to the Cordeliers at Beaucaire, but even here he did not feel secure; for hearing the report abroad that the king was determined to recall him, and yet to render him justice, he exclaimed, "Surely they do but seek my life." It is pleasing to know that he owed his means of future safety to his former dependants, who, grateful to him for the success they had obtained in life, were not unmindful of their benefit during his distress. Villaye, formerly one of his clerks, and who had already incurred personal danger in endeavouring to save some vestiges for his master's property, concerted a scheme with others who had been in Camerone's employment. They took advantage of a breach in the walls of Beaucaire, known to some of them, and having lowered their old master through this, they put him on board a vessel they had engaged, well defended by several of the "war companions," who in those days hired themselves for every description of expeditions, and he arrived safely in Italy.

The pope received him with honour, and after having allowed him some months in order to repair the disordered state of his affairs, gave him the command of several galleys employed against the infidels. It was during this expedition he died, though as to the exact manner of his death, and the extent in which he had retrieved his affairs, historians are not agreed. His last act was to recommend his children to the consideration of the king. Retribution overtook several of his enemies, as the king decreed that the remaining property should be restored to the children. Long before, however, followed between these and the unjust possessors of it; but in 1463, Louis XI., by a formal decree, testified as to the inequity of the prosecution against Jaques Caur, as resulting only from the violence of Antony Chabonnes; and put Geoffrey Caur, the null promises of which he had received, into the metropolis.
THE POLYGARS OF TINNEVELLY.

Near the southern extremity of Hindostan, on the Gulf of Manaar, and east of the mountains extending inward from Cape Comorin, lies the little-known district of Tinnevelly, formerly a tributary state to the Nabob of Arcot, with whose fortunes it thus became identified, and, with the rest of the territories of that prince, now forms the English province of the Carnatic, under the presidency of Madras. It is large and well peopled, but is unhealthy for Europeans, chiefly on account of the quantities of rice and cotton grown there. The country is in general level and bare of wood, though it has some mountains and forests, and is well watered by numerous streams which descend from the mountains in the west, while in the south and east, towards the sea-coast, are many salt marshes. The principal seaports are Tuticorin and Trichinopoly; the chief towns are Tinnevelly and Pallamotta. A great part of the land is rented by Brahmins, who do not engage personally in the task of cultivation, but employ labourers of inferior castes. There are a few Mohammedan farmers whose land is tilled by slaves, but the numerous class of cultivators are Sudras, many of whom perform all the operations of the farm with their own bands.

The inhabitants are chiefly Hindoos, and they have preserved many of their ancient privileges. This trict is one of the few in Hindostan in which landed property is recognized as being vested in individuals, such property being held on ancient tenures which have never been brought into question. It was formerly in the possession of a number of petty chiefs called Polygars, always at war among themselves, and who resided in separate fortresses in the midst of woods and other places of difficult access. These chiefs were distinguished for their valour, and were choice in their arms and armour, as is seen from the specimens given in the engraving. Their manners and customs in war were similar to those of the Maharrattas. "They wear no regular uniform, are under very little discipline, and few in the same line, either of horse or foot, have the same weapons; some are armed with swords and targets, others with matchlocks or muskets; some carry bows and arrows, others spears, lances, or war-rockets; many are expert with the battle-axe, but the sabre is indispensable with all. The men in armour make a strange appearance; a helmet, covering the head, hangs over the ears, and falls on the shoulders; the body is cased with iron net-work, on a thick quilted vest; their swords are of the finest temper, and the horsemen are very expert at this weapon. They are not so fond of curved blades as the Turks and Persians, but prefer a straight two-edged sword, and will give a great price for those which they call Alleman, or German, though formerly brought from Damascus." Having allied themselves with Hyder Ali, and broken off their engagements with the British East India Company, Colonel Fullarton, during the war against Tippoo Saib, his son, in 1783, was employed in reducing them again to subjection to the British government, which he effected after taking a number of their forts and carrying one of their forests. This was not done, however, without a severe struggle; and they more than once attempted to throw off the yoke. Major Rennell, speaking of this part of India, says, "The almost incredible number of forts and fortresses of various kinds in the Carnatic occasion a greater number of interesting positions within the same space, than in most other countries. Villages, and even towns, in open countries, are but of a day, compared with fortresses, especially when they derive any portion of strength from their situation, a very common case here."

After the subjugation of the Nabob of Arcot in 1783, he became a subsidiary ally of the English government till 1790, when, having failed to make payment to the East India Company of the amount of his subsidy, which had been fixed at nine lacs of pagodas per annum (360,000£), Lord Cornwallis assumed the management of the revenues, and employed the Company's servants for their collection. This course was abandoned in 1792, when the Nabob came anew under engagements for payment of the same amount of
subsidy, certain districts being rendered liable to be entered upon in case of failure in payment; but in 1801 the civil and military government of the Carnatic was transferred to the East India Company by the Nabob Uzeem-ud-Dowlah, upon the Company engaging to pay him annually one-fifth of the net revenue of the country, and providing for the principal officers of his government. Under this arrangement Tinnevelly is stated to have contributed about 23,000l. to the revenue. The province has now enjoyed a long continuance of tranquillity; the forts have many of them crumbled to pieces, and those still visible are fast falling to decay, while the towns and villages have multiplied in number and increased in extent.

THE COLOUR OF THE OCEAN.

Navigators have observed with great attention the varying tints displayed by the ocean in different regions, and the circumstances which apparently influence those tints. The general tenor of the evidence is collected, after making allowance for local exceptions, to the effect that the colour of the ocean approaches more nearly to blue than to anything else. "To the question, what is the colour of the sea?" says M. Arago, "the responses are very nearly identical. It is to an ultramarine blue that Mr. Scoresby compares the general aspect of the water; it is to the space of the transition between the green and blue water that M. Costaz assimilates the colour of the rippling of a current; and the two qualities of the water snows and ice. Celestial blue then, more or less deep, that is to say, mixed with smaller or greater quantities of white light, would appear to have been always the peculiar tint of the ocean."

Yet although there is not now much difference of opinion concerning the general colour of the ocean, there are many exceptions to the general rule, some of which are capable of ready explanation, while others are still subject for conjecture. A few details will show the nature of these exceptions, and the localities where variously-coloured sea-water has been found.

In 1816 Captain Tuckey, who, like the officers of the recent Niger expedition, made an unsuccessful attempt to penetrate into the pestilential regions of Africa, was sailing on the Atlantic towards the mouth of the river Congo, and observed a remarkable tint in the waters of the ocean. "After passing Cape Palmas," says he, "and entering the Gulf of Guinea, the sea appeared of a whitish colour, growing more so until making Prince’s Island, and its luminosity also increasing, so that at night the ship seemed to be sailing in a sea of milk."

Captain Horsburgh, in like manner, mentions a milk-white appearance of the sea, observed in a passage from China to Australia. Some seas present a reddish appearance, such as that which is known by the name of the Red Sea; such as is sometimes exhibited by the sea on the coasts of Brazil and of China; and such as has given the name of the Verronill Sea to a part of the ocean near California. Captain Tuckey also found the water in Loango Bay to present a deep red tinge, as it mixed with blood. The upper part of the Mediterranean sometimes assumes a purple tinge. Captain Cook, and some of the arctic navigators, describe the colour of the sea as blue. In the Indian Ocean, around the Maldive Islands, the sea presents a blue appearance, which appearance is also supposed to have given rise to the name of the Black Sea. The Yellow Sea, on the coast of China, similarly indicates the source whence its name was derived.

All the above tints are of an unusual kind, but the intermediate changes or degrees between blue and green are much more common, and have been noticed by Mr. Scoresby with great attention. He says that in the Greenland Sea, which occupies all the portion of the Atlantic northward of the Shetland Islands, the colour varies from ultramarine blue to olive green, and from the most pure transparency to great opacity; and he also observes that these appearances are not transitory, but permanent, not depending on the state of the weather, but on the quality of the water. The green-coloured water he estimates to occupy one-fourth of the surface of that sea, occupying generally in its northern part. It is liable to alteration in position, from the action of the polar current; but still it is always renewed, near certain situations, from year to year. It often constitutes long bands or streams, lying north and south, or north-east and south-west; these are sometimes more than a hundred miles in length, and thirty or forty in width. These stripes of green water occasionally near the coast of England, in high northern latitudes. In 1817 Mr. Scoresby found the sea to be of a dark grass-green tint in the meridian just mentioned, but of a transparent blue eastward of thence. In some parts of this sea the transition between the green and blue water is progressive, passing through the intermediate shades of olive and pale green, reflected by pure water procured by the melting of snow and ice. Mr. Scoresby assigns as the cause of this colour a mixture of green and blue, that is to say, mixed with smaller or greater quantities of white light, which would appear to have been always the peculiar tint of the ocean. The mode in which all these varying tints of colour are principally accounted for is by attributing them to the presence in the water of minute living animals. By referring to a paper in our last volume (page 478), it will be seen that the phosphorescence or luminosity which the sea sometimes presents, especially in a dark night, is due to myriads of minute marine animals which exist in the water at certain times and places; and it is believed that an extension of the same mode of explanation will avail in accounting for the above-named colours of the sea. Captain Cook found that the brown colour of certain seas was due to a dense assemblage of minute mollusca and crustacea. Captain Horsburgh detected, in the white-looking water of the Eastern seas, minute globular bodies linked together, and doubtless forming some species of beroe or medusus. At certain seasons of the year, myriads of red mollusca float in the seas off the coasts of Brazil and China, and give rise, in all probability, to the tint of those waters. A similar remark has been made respecting the waters of the Red Sea. Captain Tuckey, in order to discover the cause of the white appearance of the sea in the Gulf of Guinea, caused a bag, made of cloth and kept open by a hoop, to be lowered into the water, by which means he captured vast numbers of small marine animals, to which were attached myriads of exceedingly minute crustacea, the apparent source of the white appearance of the water. Mr. Scoresby was led to detect the cause of the green colour in some parts of the Arctic Sea, by a curious circumstance, which was of great value to him as an adventurer in the whale fishery. He found that the food of the whale occurs chiefly in the Pacific, which therefore affords whales in greater numbers than the blue portions of the sea, and is constantly sought after by the whales. When he examined with great care some portions of water taken from different parts of the sea, he found that the green water con-
tained immense numbers of medusæ, from which the blue water was almost free, and the number increased as the depth of green tint increased. He also traced to this cause the great difference in transparency of the two kinds of water, the green becoming very opaque, from the great number of marine animals with it; while the blue, being so transparent, that Captain Wood is said to have seen the sandy bottom, and shells swayed over it, at a depth of eighty fathoms, near Nova Zembla.

But it is found that this explanation, though generally satisfactory, is not always sufficient to account for the colour presented by the ocean. In some cases no living animals, capable of producing the effect, can be found in the water. Mr. Scrope's is doubtless correct when he states that "where the depth is not considerable, the colour of the water is affected by the quality of the bottom. Thus, fine white sand, in very shallow water, affords a greenish grey or apple-green colour, becoming of a deeper shade as the depth increases, or as the degree of light decreases; yellow sand, produces a dark green colour in the water; dark sand, a blackish green; rocks, a blackish or a brownish colour; and loose sand or mud, in a tideway, a greyish colour." Captain Tuckey, who expected to find red animalcules in the water of Loango Bay, found it quite free from such colouring agents, but discovered that the bottom consisted of much yellowish clay, without the smallest admixture of sand, and so smooth that it might be laid on in the manner of paint. It is found that at the mouths of large rivers, where a great body of water is discharged into the ocean, the prevailing colour is brownish; this appears to be caused by the impalpable mud which is brought down by the river, and which is thrown over by the water, to a considerable distance from land.

Besides the presence of animal and vegetable substances in the water, and the effect of the bottom of the sea in imparting a tint to it, a considerable portion of the change of colour appears to be due to reflexion from the sky and clouds. On this point Professor Jardine observes:—"An apparently dark-coloured sea is a common prognostic of an approaching storm; not that the water is really blacker than usual, but because the dark colour of the clouds indistinctly seen in or reflected from the waves is mistaken for the colour of the sea itself. Whatever other colour the sky happens to wear has a greater or less influence on the effect of the sky on the sea, and is apt to change its colour, and tinge it red, &c." On some occasions the edges of the waves, by refracting the solar beams like a prism, exhibit all the brilliant colours of the rainbow, which is still more nearly imitated by the refraction of the rays in the spray. Not unfrequently an indistinct image of the neighbouring coast, reflected from the rippled surface, is mistaken for the colour of the water."

By one or other of these modes, then, is the deviation from a blue tint in any part of the ocean traced to its source. Blue is now regarded as the natural tint, so to speak, reflected from the bosom of the waters. It is found, however, that the blue is more intense in the waters of the tropical regions than in latitudes approaching the arctic; and of this is furnished by the Gulf Stream, a modification of the equatorial current: this current sweeps across the Atlantic from south-east to north-west, passes round the Gulf of Mexico (which gives it a distinctive name), and then again traverses the Atlantic. During this retrograde course it is seen to be more intensely blue than when first formed, bold, when in South America forty years ago, adopted a curious mode of comparing the depth of tint in different waters. This was by using an instrument called a cyanometer (from two Greek words implying a 'measurer of blueness'), previously used by Saussure in determining the depth of tints in an Alpine sky. The cyanometer consisted of a zone or belt of pasteboard, divided into fifty-one parts, and coloured with as many different shades of blue, ranging from a depth of blueness scarcely to be distinguished from black, to a bluish white, and proceeding by regular gradations. Each shade had a particular number attached to it; and the observation consisted in determining which number in the instrument corresponded with the tint of the water (or of the sky) at any given time and place. Humboldt found that when he regarded the waters of the vast Pacific in fine calm weather, a blue of the water was much more intense than that of the sky, the cyanometric number in the former frequently reaching forty or forty-two, while that of the latter was at fourteen or fifteen.

SLATES, SLATERS, AND SLATING.
Slates, or slate-stones, as they are called in some parts of the country, are now so generally employed as a covering for buildings, that there is hardly a corner of the kingdom where some modern edifice, public or private, does not present to view a slated roof; even where nothing but brick buildings were seen in ancient towns and villages, the roof nowadays is often covered with tiles or pantiles met the eye, slated buildings are now becoming common, and most of the newly-erected brick buildings are now slated. Many, also, of the ancient parish churches, with their ponderous leaden roofs, are exchanging their lead for a lighter covering of slate; and although perhaps not quite so durable, it is the whole cheaper. Slates for roofing may be divided into three varieties, namely, the Welsh or dark-coloured slate, such as is used for writing-slates, the Cumberland and Westmoreland slate, which is of a light blue colour, and the sandstone slate, which varies in colour according to the nature and quality of the stone; but which is generally of a greyish hue. Blue is now regarded as the natural tint, and is generally employed in roofing buildings, the grey slate being so thick and heavy as to require strong and expensive timbers to support it; though in some situations where it abounds, the farmhouses and out-offices are covered with this sort, because it is found in the neighbourhood. Particular sorts of moss and lichens are apt to find a foothold on other descriptions, which, if not removed, will in time overrun them, and cause them to leak.

Notwithstanding the fineness of some of the Welsh and Cumberland slate, which will bear to be split into thin plates or lamines, of some it considerably less than half an inch in thickness, a covering of it is very durable; and whether viewed at a distance, or near at hand, it has a far more pleasing appearance than the old-fashioned roofs of red pantiles.

From the great demand there is for roofing-slate, a considerable number of hands are constantly employed in the quarries, and in conveying the slate on board vessels bound to various ports of the United Kingdom, and some to foreign ports. The mountainous district of country lying to the north of thatæstuary of the Irish Sea called Morecambe Bay, commonly known as the Lake region, yields the blue or Cumberland slate, large quantities of which are shipped from the port of Ulverston and the villages along that coast. Some of the lakes, particularly Windermere and Coniston lake, serve as channels for the conveyance of the slate in boats built for the purpose, the slate being afterwards carted to the nearest port. But even in the vicinity of these lakes the quarries are sometimes
so distant that the slates have to be conveyed several miles to the boats along steep and difficult tracks, hardly to be called roads, opened down the sides of the mountains for the purpose of getting the slate to market. Repriers are indeed in fact so difficult to approach, that it is impossible to employ carts or wheel-carriages of any description, in place of which a rude sort of sledge is made use of. Sometimes these quarries are worked open to the surface, while many are entered by narrow passages or tunnels which lead into the bowels of the mountains, so that they become the case, many young men from Westmoreland and Cumberland, and some from Wales, would be found engaged in slating in most parts of the kingdom. As disorders and the general confusion of the country cold and frosty weather is unfavourable for this work, it is seldom followed during the winter season; these persons usually returned to their native places, and there idled away a few months until the return of spring.

For a long period the slating business was almost exclusively in the hands of a few individuals, who established slate-yards in various parts of the country, employing none but their own slaters to prepare and apply the slate. But the case is much changed, for it is now the custom for stonemasons or bricklayers who are engaged in building to prepare and apply the slate themselves, and to establish their own establishments as slaters, and the business, which is by no means a difficult one to learn, is now longer thus monopolised.

The slate when sent from the mines or quarries is not in a condition to be immediately employed on buildings, as, being of a soft texture, were it dressed and squared in the first instance, the edges of many of the slates would get chipped and broken in the carriage, and they would require dressing over again. The slater, therefore, before he commences the operation of slating, proceeds to dress his slates by squaring the sides and bottom end of each slate, so that they may match closely with each other and form regular lines or courses along the roof, and perforates the upper end with square nails. Sometimes the slates are asso hard to approach, that it is impossible to employ carts or wheel-carriages of any description, in place of which a rude sort of sledge is made use of. Sometimes these quarries are worked open to the surface, while many are entered by narrow passages or tunnels which lead into the bowels of the mountains, so that they become

LAND REPRISALS.

Muratori, in his ‘Italian Antiquities,’ presents some curious information respecting the state of society during the middle ages in Italy. The utter inability of ensuring justice and the general insecurity of property led to the authorised practice of making reprisal, and of the practice he has given us the following account:

"About 1289, reprisals were granted in the several states of Lombardy, which practice prevailed so far to the detriment of the public, that not only the conveyance of merchandise from place to place was suspended, but no one undertook journeys to foreign cities. Arbitrators were eventually appointed by the The emperors, and the Guelphs and Ghibellines.

It was once the custom to employ in roofing only a class of persons known by the appellation of slaters, who invariably belonged to the section of country where the slate-quarries were situated. It is difficult to conceive a reason for this, but so it was, and continued so until within a recent period. While this was the case, many young men from Westmoreland and Cumberland, and some from Wales, would be found engaged in slating in most parts of the kingdom. As cold and frosty weather is unfavourable for this work, it is seldom followed during the winter season; these persons usually returned to their native places, and there idled away a few months until the return of spring.

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A DAY AT THE WESTMINSTER GAS-WORKS.

What Dr Arnott says of the water-pipes of London, ramifying through every street, and lane, and alley, and distributing their valuable contents to the dwellings of its inhabitants, we may to a certain extent say of the pipes through which our supply of gas is obtained. "The supply and distribution of water in a large city, since the steam-engine was added to the apparatus, approaches closely to the perfection of nature's own work in the circulation of blood through the animal body. From a general reservoir a few main pipes issue to the chief divisions of the town; these send suitable branches to every street, and the branches again divide for the lanes and alleys; while at last into every house a small leaden conduit rises, and, if required, carries its precious freight into every apartment, where it yields it to the turning of a cock." The analogy is true so far as regards the emanation from a centre, the branching out of minor pipes from those of larger diameter, the lateral small pipes leading into the houses, and the concealment of the whole assemblage beneath the pavement and road-way; but the subsequent movement from the branches back again to the centre, though observable in the flow of water through drains into the rivers and seas, the evaporation from thence, and the feeding anew the springs from which the supply was originally obtained, is not so observable in the gas circulation.

Be the analogy what it may, however, no thinking person can fail to be struck with the admirable means whereby our cities and towns are now lighted. So far back as the year 1823, when gas companies were comparatively in their infancy, a Committee of the House of Commons spoke highly of the system of lighting streets by gas, as a measure of street police; and there can be no question that the doers of evil, who "love darkness rather than light," infest the streets of London not only relatively, but positively less now than before the introduction of gas, although the inhabitants have increased three or four hundred thousand in number. The beauty and convenience of the light afforded by gas in streets, shops, and buildings, are appreciated by all; but the protection which it gives, though not so fully understood, is not less worthy of notice.

In a former volume of the Magazine, a few papers were inserted with a view of giving an outline of the gas-manufacture, the machinery employed, and the scientific principles on which the gas is produced from coal. Our present object is, in conformity with the general nature of these Supplements, to be rather graphic than scientific, to select some one establishment of note, and to describe the general economy of the place, without entering very deeply into technical detail. The articles to which we allude are in Vol. III., Nos. 159, 166, 169, 170, and 174; and the reader will find in the first of these, a sketch of the history of gas-lighting; in the next three, some details of the manufacture of gas from coal; and in the last, a notice of the manufacture of oil-gas (since then almost abandoned). These papers are illustrated by about twenty wood-cuts of the working details, an inspection of which will greatly assist in imparting clear ideas on the matter. As this article may, however, fall into the hands of readers who have not the former numbers to refer to, we shall give a line or two here and there explanatory of the uses of
different parts of the apparatus, and may as well as once enumerate the successive steps or stages in the process.

1st. The carburetted hydrogen, which constitutes the gas for illumination, is one of the ingredients of the whole, and is prepared from it by distilling the coal in highly heated vessels secluded from the access of the air. 2nd. The substance left behind in the heated vessels or retorts, after the volatile portions have separated from it, forms the fuel known as coke, which is either sold to other parties, or is used, with or without admixture with coals, to heat the coal when required. The volatile matter is then far from being pure carburetted hydrogen, that they comprise tar, ammonia, sulphuretted hydrogen, and other substances, all of which must be removed before the light-producing ingredient will be in its proper degree of purity; and the first part of this purification is effected by a piece of apparatus called a hydraulic main, in which the coarser impurities are deposited.

4th. The gaseous product passes through pipes, which are either immersed in cold water, or are sprinkled by a jet of cold water externally; whereby all the impurities which are in the gaseous form only at high temperatures are condensed, and fall into a vessel beneath; hence this vessel is called a condenser. 5th. The remaining gas contains sulphuretted hydrogen as well as carburetted hydrogen; and in order to remove the deleterious ingredient, and leaves the carburetted hydrogen tolerably pure. 6th. The gas thus made is conveyed through pipes to immense vessels called gasometers or gas-holders, where it is kept out of contact with the atmosphere by inverting the vessel in a tank of water. 7th. The gas passes through a meter or measurer, whereby the whole quantity made during a given period, and the rapidity of formation at any particular point of time, are determined. 8th and lastly. The gas is conveyed from the meter to the various streets and buildings by pipes laid underground, the supply being regulated to the demand by gauges and valves placed near the meter.

The establishment to whose arrangements the details of this paper are devoted is the Westminster station of the "Chartered Gas-light and Coke Company," which we have visited by the obliging permission of the directors. It bears in many respects the same relation to the gas-manufacture which the Soho factory bears to the steam-engine manufacture. It was the establishment which first had to bear the brunt of all the obstacles attending the public use of gas, the difficulties in the production of gas sufficiently pure for purposes of illumination, the difficulties attending the transmission of gas from the works to the houses and buildings, the enormous expense involved in the prosecution of experiments, and—perhaps the most difficult of all—to overcome the prejudices existing in the public mind. In the articles before noticed, it is stated that a Mr. Winsor, after lecturing on the subject at the beginning of the present century, formed a "National Light and Heat Company," which, though built upon rather fanciful grounds by the projector, became the parent of all the gas companies, and has ever since taken the lead among them. Thence came the name of Westminster, which was established at Westminster, forming a portion of the present large station there. Mr. Matthews, who wrote a history of gas-lighting about fifteen years ago, takes the following view of the establishment of Mr. Winsor's company, which had become a chartered body:—"Va-}
lated and stored.

more than a gas-holder, in which gas may be accumu-

ated. The coke-office is the place where all the arrangements connected with the sale of the coke are carried on; while the outer office in the 'light-office' is to white flame, while the inner office is to white light.

The two offices just named lie at the southern end of the large quadrangle or court; and from them we will proceed to the other buildings, turning to the right after passing the entrance-gates. At and adjacent to the south-east corner are four of those bulky vessels which form the most conspicuous objects in a gas-
factory. The term gasometer applied to these vessels is a very inappropriate one, inasmuch as it conveys an idea of measurement as connected with the purpose of the vessel; whereas the gasometer is in truth nothing more than a gas-holder, in which gas may be accumu-

lated and stored. In the earlier history of the manu-

facture, the gas-holder was made to serve the purpose of a gas-measurer, by the addition of a scale of feet and inches, so that the depth of gas in the vessel, multiplied by its area, gave the cubic contents; and thus the term 'gasometer' became introduced. So far as regards the quality and efficacy of the gas, a gasometer might be dispensed with; and thus the pressure of the gas, measured as the result of the atmospheric pressure and the weight of the gas-holder, would be so effectual as to regulate the supply to the varying demand. As a shopkeeper provides a store of goods more than sufficient for immediate demand, in order that he may be prepared for future fluctuations; so must the gas-

works accumulate during the daytime a quantity of gas adequate to the enormous and sudden demand which occurs about dusk. From the first establish-

ment of gas-works it was found necessary to provide a reserve store, but it was hoped that some means would be discovered of dispensing with the bulky gaso-

meters. Such means have, however, not been found, and all the gas-works exhibit these capacious reservoirs of gas. As a gasometer is not more than twenty of these, a larger number, we believe, than has been congregated in any other place, although some establishments have individual gasometers of larger capacity. Persons to whom the ar-

rangement of gas-apparatus is not familiar are often surprised at the different appearance which a gaso-

meter, as seen towering above the wall of a gas-factory, presents at different times. At one period a kind of scaffolding of light and elegant iron-work is seen, forming a triangular space, within which an enormous cylinder stands at a small height from the ground; at another time, perhaps, after an interval of a few hours, the cylinder will be seen to have ascended ten or twelve feet; and at a subsequent period to have as-

cended nearly to the top of the framework forty or fifty feet in height. These differences may be easily understood if it be borne in mind that a gasometer consists in reality of two vessels, one within another, the outer one being a tank open at the top and closed at the bottom, and the inner one being an inverted vessel open at the bottom and closed at the top.

The tank is filled to a certain height with water, into which the inverted vessel dips, so that the in-

terior of the latter is cut off from communication with the external air by the interposition of the water. A pipe passes into the tank quite through the water, and terminates in the vacant space within the cylinder; and through this pipe the gas, when completely made and purified, is conducted. Now as carburetted hydrogen (common gas) is not half so heavy, i.e. has not half the specific gravity of atmospheric air, a cer-

to its bulk is collected in the cylinder gives it an ex-

sive power to the latter, notwithstanding the ponderous character of the metal; and the cylinder rises higher as the quantity of the contained gas increases. Balance-

weights are suspended outside the gasometer to counter-

balance in a certain degree the weight of the iron cylinder; and these weights are so adjusted as to give
to the gas a purely elastic force slightly greater than that of the atmosphere. The reason of a gaso-

meter rising, then, when full, is that the iron gaso-

meter with its included carburetted hydrogen is lighter than an equal bulk of atmospheric air.
The tank of a gasometer is made of cast-iron, while the gas-holder is formed of sheet-iron, the sheets being riveted at the edges, and a piece of string being in-

serted at every joint, to make it air-tight—a simple but valuable contrivance suggested a few years ago by a workman. In some cases a strip of tarred canvas is inserted at the joints, or else canvas coated with white lead.
The four gasometers described as occupying the south-west corner of the quadrangle, the space which is termed the telescope construction, in which there are two gas-holders, one within another, and both within the tank; the inner gas-holder is filled first, and then, by an ingenious contrivance, elevates the outer one as the gas continues to enter; the object being to gain a greater capacity without increasing the diameter of the tank, since the increased height of the apparatus is not so costly as an increased ground area. The tanks of these gasometers are about forty feet in diameter and eighteen feet high; and the gas-holders when full reach to a height of nearly forty feet. About twenty years ago there were some strange misconceptions afloat respecting the danger to be apprehended from the explosion of gasometers; but in the Report of a Com-

mittee appointed to investigate the matter, the follow-

ing remark sets the doubts at rest:—"As long as every part of this reservoir is kept in good repair and per-

fectly tight, the pipes leading into and out of it main-

tained in proper condition, and plenty of water sup-

plied, so that the parts which should be under water never be left bare, it seems to your Com-

mittee scarcely possible that any explosion should take place." The experience of subsequent years has shown that the gasometers are perfectly safe, and they are now made of much larger dimensions than any known at that time. The average capacity of the four allowed to above is about forty-five thousand cubic feet each.

Proceeding northward along the right-hand boun-

dary of the quadrangle, we come to other gasometers enclosed in brick buildings. In the infancy of the gas manufacture, when this establishment was making varied and costly experiments as to the best mode of conducting the operations, it was at first supposed that the gasometers ought to be not only bounded by brick walls, but covered with roofs. Experience has since shown that these expensive additions are not necessary; but the brick buildings (though now roofless) still remain, and serve as a memento of the gradual steps by which excellence and economy have been reached. Great indeed is the change since the time when second-hand brewers' vats were used as gaso-

meters!

Between or adjacent to the gasometers are citerns whose use curiously illustrates the branches of com-

merce which arise out of the gas manufacture. We have slightly noticed, and a reference to our former numbers will render more clear, the separation of a
liquid containing the alkali ammonia, from the other products of the combustion of coal. This ammoniacal liquor was at first a trouble and a burden to gas manufacturers; but after a time a market was found for it, and it is now regularly purchased by the proprietors of chemical works, as a source whence ammonia, or some of its compounds, may be obtained. The tar, which is another product of the combustion of coal in retorts, and of which more than a hundredweight is produced from a chaldron of coal, is separated from the gas by the same process, and in the same vessels as the ammoniacal liquor, and is in fact mixed with it; but as the tar has greater specific gravity than the ammoniacal liquor, it gradually assumes the lowest place in the vessel, and is then easily separated. Different plans have been adopted at different establishments in appropriating the tar thus produced; some sell it at once, as fast as it is produced; some consume a portion of it as fuel in the retort-house; while others, by a process of distillation, separate it into a volatile oil or naphtha, a fixed oil, and a solid residue commonly known by the name of pitch.

From the gasometers and the tar and ammonia-vessels is a roofed building called the "condensing or purifying house," filled with a complicated series of vessels, employed, first, in condensing all those impurities which are capable of condensation, and secondly, in purifying or separating the gas from a portion of sulphured hydrogen which is always produced with it, and which, besides interfering with the brilliancy of the light, would produce a most disagreeable and unwholesome odour. Condensers of a great variety of forms have been used at different times and in different establishments; but those at the works under consideration consist of a pipe with a number of ascending and descending bends in it, and shirts or bands, through which the tar and ammonia to flow out. A constant stream of cold water is flowing down the outside of each pipe, by which the gas, as it passes through, is cooled, and the condensable impurities separated from it. From the condenser the gas passes to the purifiers, of which there are three complete sets in the purifying-house, each set consisting of three or four large cast-iron vessels. Referring to our former articles for a full detail, we may here merely state that the three or four purifiers forming one set are placed side by side, but at different elevations; that each vessel is supplied with lime-water, which is kept constantly stirred by a revolving apparatus within; that the gas passes successively through the vessels, parting as it goes with its sulphured hydrogen, which combines with the lime-water. The lime-water is changed frequently when it becomes too much sulphured, and matters are so arranged that one bushel of lime will purify twenty thousand cubic feet of gas.

In immediate connection with the building in which the condensing and purifying processes are conducted is an Artesian well, for supplying the large quantity of water, of which a considerable quantity is required. The well is in the old form, excavated and bricked, to a depth of a hundred and twenty feet, after which it is continued by an Artesian bore to a further depth of a hundred feet. This is one among the instances which will probably be greatly multiplied in future, of the substitution of a small expensive excavation; and rests on a principle which has been before explained in this work, viz., that if the watery stratum lying between the clay and the chalk be reached, a small bore is effectual as a well several feet in diameter.

The rotating machinery in the purifying vessels, the working of the pump in the well, and the removal of the tar and ammoniacal liquor from one vessel to another, are effected by steam-power, which is afforded by two steam-engines, one situated under the roof of the purifying-house, and the other in the building occupying the central portion of the quadrangle. The connecting machinery by which this power is transferred to the purifiers comprises the usual arrangements of shafts, bevel-wheels, straps and bands, &c., and gives a busy appearance to the building.

The next building to the purifying-house is one in which the sulphured lime undergoes certain processes, after being removed from the purifiers. Some of the most important improvements in the gas manufacture relate to this part of the proceedings. The lime-water is conveyed from the purifiers to a large underground cistern, and from thence to a range of iron vessels, into which the gas is poured, settling the lime, and pouring it into shallow pans occupying the floor of the furnaces or ovens in which the retorts are heated. This mode, so far from being inconvenient, is productive of benefit in another way; for the steam arising from the liquid tends to cool the bars of the furnace, and thus to preserve them.

Next to this is a large carpenter's shop, in which wood-work for various purposes connected with the factory is made and adjusted. Adjoining this is a store-room for fire-bricks (used in the retort furnaces) and some other articles; and in the open area in front are two large vessels, called saturators, through which the whole of the gas passes after leaving the purifiers and before being conducted to the gasometers. The gas is then passed into the large quadrangle, from the north-east corner of which our frontispiece is taken. The building which occupies the principal part of the sketch is the central building before alluded to, through openings in which some indications may be seen of the fiery nature of the operations within. The buildings at the right are those on the western side of the quadrangle; while the ground gives some idea of the busy scene which the whole place presents: here waggons laden with coal and passing to the coal-stores; there waggons and carts belonging to dealers in coke, who have come to purchase; in one place heaps of iron pipes; in another, of retorts, about to be put in the place of old ones; while men are bustling about in all directions.

The western side of this quadrangle is occupied almost entirely by gasometers, enclosed in brick buildings without roofs. A portion of the space is however occupied as a coal-store, one of the many receptacles for the vast quantity of coals consumed here. A contemplation of such immense supplies of fuel, and of the invaluable services derived therefrom, brings to mind the remark of a well-known writer, to the effect that "the coal-roads of Britain are, in effect, mines of labour or
power, vastly more precious than the gold and silver mines of Peru, for they may be said to produce abundantly everything which labour and ingenuity can produce, and they have essentially contributed to make her mistress of the industry and commerce of the earth. Britain has become to the civilised world around nearly what an ordinary town is to the rural district in which it stands, and of this vast and glorious city the mines in question are the coal-cellars. Fears have been entertained by some that the time must be looked forward to when this precious supply will fail—when the mines, worked at their present enormous rate, will no longer yield their wonted product. But the more investigations are made, the more remote seems to be the time when such a misfortune will befall us; and we may safely leave to future ages the adoption of a remedy, if not a prevention.

We will for the present leave unnoticed the central building in the large quadrangle, and proceed through an arched entrance into the inner court, which is much smaller than the other, and without any central erection. On the right of the entrance is a store for timber and other materials. At this part of the premises is another series of condensing and purifying apparatus, comprising vessels similar to those before described, as well as an ammonia tank, pumps, &c. Beyond these, on the right, is a large smiths'-shop, where men are busily engaged in the repair and adjustment of various articles used in different parts of the works. The gasometers, condensers, purifiers, tanks, retorts, mains, pipes, and other iron-work of magnitude, are of course made at the large foundries, but there are abundant demands for smiths'-work on a smaller scale at such an establishment as this. Beyond the smiths'-shop is another coal-store, and near this is the northern entrance to the works from Peter Street.

The northern end of this smaller court is occupied principally by one gasometer, the largest in the establishment, having a capacity of eighty thousand cubic feet: it is well placed, and has an imposing appearance, especially when raised to a height of fifty or sixty feet, as it was when we saw it. On the left or west side of the court are two of the four retort-houses iron-roofed buildings, in which the gas is made. The arrangement of these houses we shall speak of presently, and need only say here that these two present the same striking and remarkable features which characterise the other two. In the open court of the quadrangle are indications of the same traffic and bustle which the other presents: the arrival and unloading of cargoes of coal, the heaping and sprinkling of the heated coke just brought smoking and steaming from the retort-house, &c. At various convenient places in this, as in the other quadrangle, are store-houses for coal, from whence the retorts are supplied; and in addition, wherever room could be found for them, gasometers are placed, to the number, in all, of twenty-one.

We have now noticed the principal buildings, apparatus, and general arrangements round both quadrangles of the establishment, and will next return to the one first described, and take a hasty glance at the building in its centre. This building is divided into various departments, such as a deputy superintendent's office, an inspector's office, a meter-room, a valve-room, two retort-houses, a coal-store, a coke-store, an engine-room, &c. The four first-mentioned rooms form a kind of additional building attached to the southern end of the remainder, and, with its motto "Sext Capitolum Fulgens," is the first object which meets the eye from the entrance. The retort-houses are built at a few feet distance from the ground, leaving space beneath for the coal and coke stores.

Whoever enters for the first time into a retort-house cannot fail to be struck with its appearance, so different from that of most other factories. The iron roof, the iron floor, the absence of windows, the absence of machinery and work-benches, the strange appearance of the walls speckled over with complicated iron-work (whose purpose is not clearly discernible), the dark-
ness of the place, the appearance of the men—all have an aspect of strangeness. But at intervals of every hour or two, and especially at night, the visitor's attention is suddenly awakened to a startling sensation going on within the building. He sees a party of men advance to one part of the side apparatus; he sees them turn the handles of what appear to be screws; he hears several explosive reports, followed by the removal of circular iron doors or covers about a foot in diameter; he sees a burst of flame from each hole whence a cover has been removed; and on going in front of one of these openings (if he have courage enough) he will perceive a mass of intensely burning coal, or rather coke, extending back to the depth of six or seven feet. Then will follow the removal, by means of rakes, of all the burning materials from each opening; then the hissing and steaming consequent on the wetting of the coke by buckets of water; and then the re-charging of the heated cavity with fresh coals. It is not until after noticing this succession of operations that a stranger can rightly understand the arrangements of such a place. They are—with slight exceptions, which we need not heed here—as follows: Each side of the retort-house has a succession of arches, rounded or pointed, about six or ten feet high, and about as many in depth. These recesses, when bricked or otherwise closed in front, form ovens or furnaces, in which fuel is burnt on a grate at the lower part. Five, six, eight, or more oblong iron vessels, each holding from two to three bushels of coals, are ranged horizontally in this oven, from front to back, so that the heat, flame, and smoke from the furnace may play around them, and make them red-hot. The outer end of these vessels, which are the retorts (a name for which we have never heard a good reason assigned), are left open or closed as occasion may require; an iron door, connected with a screw, being accurately fitted to each retort. The retorts (at the Westminster works) are semi-cylindrical in shape, with the flat side placed lowermost. The average height of the retorts is perhaps about five feet from the ground; under them is a fireplace, through which the fuel is introduced by which they are heated; and under this again is a kind of ashl-pit or shallow vessel into which the coke is thrown; and covered by a cover. The operation then consists in this:—The empty retorts are first brought to a red heat; then a 'charge' of coals is introduced; then the cover is screwed on the end, and made air-tight by a cement of clay and lime. Thus the retorts remain for about five hours, during which the fireplace is opened every hour for the renewal of the fuel (coke at these works) with which the retorts are heated; and at the end of this time all the gaseous and vaporizable matters having left the coal, and passed up from each retort by a pipe into the 'hydraulic main,' the 'drawing of the retorts' commences. The retort-cover is loosened by turning a screw; a slight explosion takes place when communication with the atmosphere is opened; the cover is removed by the sooty and almost fire-proof hands of the men, and the coke is drawn out by means of rakes eight or ten feet long. A kind of box, made entirely of iron, and placed upon wheels, is wheeled beneath the front of the retorts, and into it a portion of the fiery contents of each retort is drawn. The box is wheeled away, and in a few minutes steam is ascending profusely from it, the result of a plentiful supply of water, which is thrown on it for the sake of speedy cooling. The remainder of the coke is then drawn out on the iron floor of the building, and after being partially cooled by water, is removed out into the factory yard. While standing within a few feet of a party of men engaged in 'drawing' a group of seven or eight retorts, apparently unharmed and unconscious of a degree of heat which would scare others, we thought of Schiller's 'Road to the Iron-foundry;' the fate intended for poor Fridolin, but experienced by the envious Robert; 'the chuckle with which the forgesmen pointed to the manner in which their lord's orders had been executed; but it was satisfactory to think that neither a Robert nor a 'gentle Fridolin' could be inserted in a gas-retort; nor are the stokers, though swarthy enough without, so black or so stony-hearted within as Schiller's forgesmen. The other arrangements of the retort-houses may be understood with tolerable clearness by a reference to our former papers, and we shall therefore devote only a few lines to them. In the upper part of every retort is an opening from which ascends a vertical pipe three or four inches in diameter. The gas, as it is formed, having no other outlet, passes thence to another pipe placed horizontally, and then enters a descending pipe, which dips into a large main fourteen or fifteen inches in diameter. This main is placed horizontally along the whole length of the retort-house, and receives all the gas from the whole range of retorts on one side, there being two mains on opposite sides of the retort-house. The advantages of this arrangement are obvious, and it is evident that purification of the gas which is the object of four successive processes, carried on in four distinct kinds of apparatus, viz., the hydraulic mains, the condensers, the purifiers, and the saturators. As may be readily supposed, the transference of the various products—such as gas, tar, ammoniacal liquor, &c.—from the vessel to vessel, through an assemblage of pipes, some of which are carried underground, and others within view. The retort-houses, such as we have just described, are four in number; two situated in the northern quadrangle, and the other two being placed parallel and contiguous in the central building of the southern quadrangle. From these we pass to a series of smaller rooms attached to the southern end of the retort-houses, and within view from the entrance gates. One of these is the office of the deputy superintendent of the works, and the other two contain very ingenious specimens of apparatus whereby he can regulate the supply of gas at all hours of the day, calculate how much gas has been manufactured, ascertain the rate at which it is being manufactured at any particular time, and keep a check over the labours of the men. One of these rooms is called the 'valve-room,' and contains the apparatus for regulating the pressure and supply of the gas. To understand the use of such apparatus, it is necessary to recall to mind the striking change which occurs throughout London as evening is drawing on. The lamplighter is seen busily hastening from lamp to lamp, placing his slight ladder against the street lamp-irons, and kindling the flames which give to our streets no small share of their evening attractions; the shopkeeper begins to illuminate his wares, with one blaze if he be an humble dealer, with a dozen if his house be a 'gin-palace,' with a score or two if he sells 'unparalleled bargains' in linen-drapery; the theatres, the club-houses, the evening exhibition-rooms—all begin to display a blaze of light near about one time. Now it must be obvious that the sudden demand thus created is enormous, and it may easily be conceived that great judgment is required in adjusting the supply. In order that the gas may be propelled through the main-pipes from the factory to the remotest point supplied from the works, it is necessary to give the gas a pressure or elastic force greater than that of the atmosphere. If this pressure be too small, the lights at remote places would burn much too faintly; if too large, the flames would become so strong as to consume an inordinate
quantity of gas; if the gas flowed from the gasometers at an hour before dusk at the same rate as at an hour after dusk, the utmost confusion and irregularity would otherwise be obviated to the nature and extent of the district through which it passes, a pressure-apparatus is attached to it distinct from the others. Directing our attention to one main only, we may state that after the gas leaves the gasometers and enters the main, it is placed in communication with a small tube leading to a 'pressure-indicator,' by which the exact pressure at any time of the day or night is determined. So long as the pressure is such as is required, no changes are made; but when it is either too great or too small, recourse is had to a valve, whose interior apparatus is in connection with the main. If the pressure is too great, the valve in drawn partly across the main, by which the supply of gas is slackened; if too small, the valve is opened. In the troughs before the fire-iron boxes, in placing next layers of cement on the retort-covers to be used after the next drawing, in carrying out the coke into the open air, and afterwards into the sheds or stores, in bringing coals from the coal-stores to the retort-houses, in removing the ashes which fall into the lime-water in the ash-pit, and in various other duties subsidiary to the manufacture of gas. The subsequent preparation, or rather perfecting of the gas, demands but a small amount of manual labour; it is in fact performed by the steam-engine, which pumps the water from the well, transfers from vessel to vessel the tar and the ammoniacal liquor abstracted from the gas, and sets in rotation the arms or fans in the purifying vessels.

There is perhaps no part of the gas mechanism which requires better workmanship and more careful attention than the pipes which convey the invisible gas from the works to the places where it is consumed. However perfect may be the mode in which the gas is manufactured, however plentiful the supply, yet if the pipes are either too small or too large, if they are laid either too horizontal or too much inclined, if any of the innumerable joints are imperfectly fitted, the most serious inconvenience results. The mains vary from three inches to eighteen inches in diameter, independent of the small lateral pipes which are supplied from the main; and the diameters of these mains are made to depend not only on the magnitude and importance of the street, but on its elevation, its distance from the works, and other circumstances. There is a circumstance attended to in laying down the mains which is perhaps not generally known. They are laid with a gradual inclination, amounting perhaps to ten in a hundred yards, instead of being horizontal; and when this slope has continued for one or two hundred yards, the mains begin to ascend in a similar degree. The line of mains thus ascends and descends alternately throughout its whole length. The reason for this arrangement is, that a small deposition of fluid takes place in the mains; and in order to distribute the liquid evenly through the whole extent of the mains, the fluid adheres at the lower points, where two descending lines meet: here a reservoir is formed, into which the liquid flows, and by the occasional use of a small pump from above the inconvenience is removed.
How few persons would guess the length of these underground arteries! How few would suppose that the mains, proceeding from the Westminster works alone, and ramifying through the streets at the west end of the town, would, if laid in a straight line, reach from London to Bristol; or, if combined with the ‘service-pipes’ which pass from the mains to the houses, extend from London to Exeter! Yet such is the case. Rapid as has been the erection of new houses, the extension of the gas-manufacture has proceeded with immeasurably greater rapidity. In the year 1814 there was only one gasometer at the Westminster station of the Chartered Company, then the only company in London; and this gasometer held only fourteen thousand cubic feet. By the year 1822, according to a Report on the various gas-works presented by Sir William Congreve to the Secretary of State, the Westminster works had reached the following position:—"The whole number of retorts which were fixed was 300; the greatest number working at any time 221; the least number 87. Fifteen gasometers, varying in dimensions, the contents computed at 20,626 cubic feet each, amounting to 309,385 cubic feet altogether, but never quite filled. The extent of mains belonging to this station is about 57 miles; the produce of gas, from 10,000 to 11,000 cubic feet from a chaldron of coals. The weekly consumption of coals is reckoned at forty-two bushels for each retort, amounting to about 602 chaldrons; and taking the average number of retorts worked at this station at 158, would give an annual consumption of coals of upwards of 9282 chaldrons, producing 111,384,000 cubic feet of gas. The average number of lights during the year 1822 was 10,660 private, 2249 street lamps, and 3884 theatre lamps." In the interval which has elapsed since this Report was made, great extension has taken place in all the operations of the gas-manufacture. The Westminster station now contains about six hundred retorts; the twenty gasometers have an aggregate capacity of nearly eight hundred thousand cubic feet; the length of main-pipes exceeds a hundred and twenty miles, and of service-pipe fifty miles. The quantity of gas which leaves the works on a midwinter's day is a million and a quarter cubic feet. As to the area of ground over which this quantity is spread, it may be best seen by taking a map of London, and tracing out a boundary, of which the northern part shall be Oxford-street, the eastern Temple-bar, the western Grosvenor-place, and the southern the Thames: the maze of squares, markets, streets, and lanes included within this boundary points out the scene of operations.

Whether or not we accept the motto used by Mr. Matthews in his work on Gas-Lighting,—

"This is an art which doth excel nature."

there is abundant room for admiration and congratulation in the history and application of this light-giving agent; and the following statement, from the 'Penny Cyclopaedia,' shows how extensively the advantages are now appreciated:—"Every large town in Great Britain has long had gas; the smaller towns have followed, and there is now scarcely a place in the kingdom without it. The continental nations have slowly followed our example; Paris for some years, and more recently the towns of Lyon, Marseille, Bordeaux, Nantes, Caen, Boulogne, Amiens, and several others, have adopted it. It is in use in many parts of Germany and Belgium, and St. Petersburg has a small establishment which is rapidly increasing under the superintendence of a gentleman from one of the London works. The larger towns in the United States also burn gas; and even in the remote colony of New South Wales, the town of Sydney has introduced this valuable invention, which we have no doubt will be found there, as it has been in London, as useful in preventing nocturnal outrage as an army of watchmen."
ABORIGINES OF BRAZIL.

The discovery of America gave to the physiologist and the philosopher the opportunity of studying the peculiarities of a race of men whose existence was unknown before the age of Columbus. Their complexion is of a reddish-copper hue, not unlike cinnamon; the forehead low, and the outer angles of the eyes are turned upwards; the eyebrows are high; the cheek-bones prominent; and the black, long, coarse, and shining hair does not grow thickly on the head. The circumstances which connect this race with the rest of the human family are involved in an obscurity which renders conjecture even of intense interest. The recent peopling of the New World is now generally abandoned as inconsistent with the philosophy of known facts. From whence then did this population spring, possessing as it does certain characteristics which belong to it alone? In the absence of historical records and tradition, conjecture has wandered without restraint. By one writer it is supposed that America was peopled from the dispersion of the Israelites; by another, that the Egyptians were the ancestors of the Mexicans; while a Carthaginian origin has been given to them by others. Again, the purely Asiatic origin of the aborigines of America has been strongly supported. The monuments and remains of an ancient period which are to be found in various parts of North and South America—as the mounds of earth and fortifications in the valley of the Ohio, now overgrown with the tallest and oldest forest trees; the pyramids of Mexico, and works comparable only to those of ancient Egypt; the remains and the bas-reliefs near Guatemala; the works of the ancient Peruvians—were, even on the discovery of America, regarded by the aboriginal inhabitants as the remains of a much more ancient people. They are proofs that this anterior race possessed a higher degree of civilization than now exists, and a melancholy interest is attached to their decline. Of the causes of their decadence not a single tradition has been found. We see only the effects of some catastrophe by which the bonds of the social state have been snapped, and the population scattered into the smallest aggregate bodies, consisting in some cases of a family, that is, of relations by blood and marriage, and divided from others by feelings of hostility and by difference of language. At the same time, their uniformity of manners, customs, and modes of living, prove that at one time they have formed part of a larger body politic. The multiplicity of languages among the aborigines of America is a most remarkable feature of their present state. Dr. Von Martius, in his 'Travels in Brazil,' states that "out of twenty Indians employed as rowers in the boat in which we navigated the streams of the interior, there were often not more than three or four who understood any common language. No common voice or common interest cheered them as they sat beside each other during a journey of several hundred miles, which their various fortunes had called them to perform together."

Brazil is about sixty times larger than England, and it would require many years of patient investigation to discover the affinities and relative position of the tribes to be found in this vast territory. Dr. Von Martius has furnished more than two hundred and fifty names of nations, hordes, or tribes at present found in the country; but some of them belong only to small
clans, or even single families. The tribes which consist at most of a few families are chiefly found south of the River Amazons, where the disruption of the population has been greatest. Such tribes, clans, or families possess a very imperfect language, and live isolated in their native forests. In the central and southern parts of the country there are five powerful tribes, whose aggregate number exceeds sixty thousand, each tribe varying in number from eight to eighteen thousand. The Tupis, who were found settled everywhere on the coast when the Portuguese first visited Brazil, have now lost their independence, and consist of two or three tribes; but their former power is still attested by the number of words of Tupi origin applied to places over a large extent of country. Humboldt estimated the number of the copper-coloured race in the two Americas at six millions, but the proportion existing in Brazil is not known.

With the exception of the Murâs, who are without houses, and whose wandering habits have gained for them the appellation of the gypsies of Brazil, all the tribes practise some sort of agriculture, and most of them rear poultry. Each tribe has its own plantation, which is cultivated by the women for the common benefit; and certain ideas of common possession prevail with regard to their huts and utensils, which belong to the tribe rather than to individuals; everything being appropriated as personal property except a man's accoutrements, his weapons, pipe, and hammock. It is considered unlucky to use the weapons of another in following game. The hunting-ground of each tribe is defined by well-known boundaries. Theft is scarcely known, and accumulation for the supply of future wants does not enter into the Indian's ideas. Several of the tribes carry on trade with the whites. The trade is one of barter, and loans and deposits are the only securities of which they have any notion.

A good idea of the daily mode of life amongst the Brazilian tribes is furnished by Dr. Von Martius, in the following extract from his Travels:—"As soon as the first rays of the sun beam on the hut of the Indian, he awakes, rises immediately, and goes to the door, where he generally spends some time in rubbing and stretching his limbs, and then goes into the woods for a few minutes. Returning into the hut, he looks for the still live embers of the fire of the day before, or lights it afresh by means of two dry sticks, one of which he sets upon the other, twirling it till it kindles. In thirty to forty minutes, he adds dry grass or straw. All the male inhabitants then take part in the business; some drag wood out of the forest; others heap up the fire between several large stones, and all of them seat themselves round it in a squatting attitude. Without looking at or speaking to each other, they often remain for hours together in this position, solely engaged in keeping the fire, or roasting Spanish potatoes, bananas, ears of maize, &c., in the ashes for breakfast. A tame monkey, or some other of their numerous domestic animals with which they play, serves to amuse them. The first employment of the women on leaving their hammocks is to paint themselves and their children, on which each gets her particular domestic task. They go to the forest, plucking the threads from the palm-trees, manufacturing nets, making earthenware, rubbing mandiocca, and pounding maize, from which they make a cooling beverage. Others go to their little plantation to fetch maize, mandiocca, and beans; or into the forest to look for fruits and truffles. When the men have finished their frugal breakfast, they sit down on the earth, threading the strings, &c. It is not till the sun is high and the heat considerable that the Indian delights to bathe himself, and then goes between nine and ten to the chase, generally accompanied by his wife. On these occasions he takes the narrow almost imperceptible footpaths, or goes directly across the forest. If the object of his journey is distant, he breaks branches of the shrubs as he goes along, which he leaves hinging or scattering in the path in order the more easily to find his way back. He has taken some small animals, or one large one, their hunting is over for that day, and the woman carries home the game in a bag, which is fastened to her forehead by a band. The cooking of the dinner, as well as keeping in the fire, is the business of the men. Pigs are reared; other hairy animals are splitted with the skin and hair on, and put to the fire; birds are slightly plucked and then drawn. The body is split on sticks, either whole or in pieces, roasted at the fire, or put into the pot with water. The Indian prefers roast meat, especially when very fresh, to boiled. The tapir, monkeys, pigs, armadillos, paca, and agoutis are his favourite dishes, but he readily eats deer, birds, turtles, and fish, and in case of need contents himself with serpents, toads, and larvae of large insects roasting generally done after the chase, about four o'clock. The inhabitants of the hut, or any neighbour or individual of the same tribe who happens to be present, partakes of the meal. Every one, without regard to precedence, pulls off a piece of the meat, and squats down with it, at a distance from the fire and apart from the rest, either in a corner of the huts, or under the roofs; salt, but use as seasoning a berry of the capsicum species. The wife places a vessel of mandiocca flour near the fire, and each takes a handful of it, which he dexterously throws into his mouth. When the meal is over, a member of the family fetches a vessel of water from the neighbouring brook, out of which every one makes himself a drink. There is no regular table nor cutlery for this purpose. About eight o'clock in the evening, if the object of his journey be distant, he breaks branches of the shrubs as he goes along, which he leaves hinging or scattering in the path in order the more easily to find his way back.

The huts of the Coroados tribe are also described by Dr. Von Martius:—"They were supported by four corner-posts, twelve or fifteen feet high, and were connected by wicker-work, and sometimes plastered with clay, had on both sides openings the height of a man, with moveable doors of palm-leaves; the roof was made of palm-leaves and maize straw; the hut was closed on the windward side, or, where the sides were entirely open, the roof extended much farther and lower down. In every hut there were in different parts of the floor hearths for the several families residing in it. Some families had huts resembling tents, made entirely of palm-leaves. There was no other issue left for the smoke but through the roof and the doors. Hammocks, made of cotton cords, which at once supplied the place of tables, beds, and chairs, were suspended to the posts, and the huts about a foot from the ground. They are the chief article of furniture. Some earthen pots, baskets made of palm-leaves, filled with Spanish potatoes, maize, mandiocca roots, and other fruits of the forest, drinking vessels, a hollow trunk of a tree for pounding maize, constituted the whole of their household furniture. The arms of the men, bows and arrows, leathern bags, form the balls.

Sixty or seventy years ago it was the fashion to admire the sort of life which the Indian leads in his native forest; and if a listless state of existence under a fine climate were the summum bonum of life, the condition
of the uncivilized aborigines of Brazil might be envied; but in such a state the human mind becomes incapable of attaining the enjoyment for which it is destined. The noblest faculties are directed to no higher object than the pursuit of wild animals or the stratagems of war; and even the pleasures of the senses are blunted. The works of the greatest writers that surround them in the splendid solitude of the New World awaken no admiration, and their minds are too infantile to be capable of looking beyond the range of their daily wants. In connection with this obtuseness and apathy, which admits neither of mental pleasures nor any but the costliest attachments of domestic life, we find the practice of cannibalism existing among some tribes, and this in one of the most luxuriant regions of the world; infanticide is still more common; and many tribes put the aged and infirm to death. Dr. Von Martius states that the Guaicuru women never rear any children before their thirtieth year; the Guanás often bury their female children alive, and even the mothers expose their greatest luxury in their superstitious feelings and splendid dresses than their descendants in modern times. But how vast is the difference between their days and ours, in which personal fame has come to be synonymous with absolute misery!

It is to glass, again, that the poor man owes the estimable blessing of the free admission of light to his dwelling, even in the coldest climate. It is not easy to exaggerate the value of these two products, soap and glass, to mankind. During the war, France was deprived of her accustomed supply of barilla (the usual source of soda) and of soap from Spain, the ports of both countries being watched by the British fleet. The high price of soda, soap, and glass, consequent on this state of things, was multiplied through the splendours of enthusiasm and splendour, the price of the materials became a point of usual importance than previously; that of nitre was so high as to stimulate the manufacturer to search for some substitute, which was speedily found in the nitrate of soda, enormous deposits of which have been discovered in South America. This salt is much cheaper than salt-petre, and preferable to it for the manufacture both of nitric acid and of sulphuric acid; but besides the direct

**IMPORTANCE OF CHEMICAL SCIENCE IN MANUFACTURES.**

[From Dr. Gregory's 'Letter to the Earl of Aberdeen on the State of the Manufactures.']

The first great stimulus to the improvement of the manufacture of sulphuric acid was given by the announcement of a prize of 1,000,000 francs (40,000l.), offered by the Emperor Napoleon for the discovery of a simple and cheap process for extracting soda from sea salt. Soda, as is well known, has been used, from time immemorial, for the manufacture of soap and glass, to mankind. Its formation was studied by the most accomplished chemists, and brought to a conclusion, and every year produced some new amelioration, and the large profits realized by the makers of sulphuric acid, turned the attention of men of science to the improvement of this latter manufacture. Sulphuric acid is made in vessels, or rather chambers, of lead, of which the chambers are formed, and the plates of lead, of which the chambers are formed, were soldered together with difficulty, by means of lead, 110 lbs. of sulphur, which by the operation is so easy, that a child can perform it. Again, the acid was formerly concentrated in enormous glass retorts; these were exposed to breakage, occasioning heavy loss, and destroying the furnaces; vessels of platinum are now used for concentrating the acid, and although these sometimes cost from 1000l. to 1500l. apiece, they are found, from their durability, to be a source of economy, and to materialy contribute to bring about the very low price of the acid: moreover, it is the demand for platinum for such vessels that alone renders profitable the working of the Russian mines of that metal.

When economy had been pushed thus far in the apparatus, the price of the materials became a point of more importance than previously; that of nitre was so high as to stimulate the manufacturer to search for some substitute, which was speedily found in the nitrate of soda, enormous deposits of which cover whole plains in South America. This salt is much cheaper than salt-petre, and preferable to it for the manufacture both of nitric acid and of sulphuric acid; but besides the direct

[Taken from the \*Penny Magazine.\*]

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of chlorine were known, but had not yet been applied on the great scale. At first the chlorine was disengaged directly from the muriatic acid, and brought in contact with the cloth to be bleached, in the form of pure free chlorine. But it was soon found that, by combining the chlorine with lime, it might be obtained in a solid form (bleaching-powder), capable of transportation to any distance; hence arose a new and lucrative manufacture, of such importance, that it may safely be asserted that but for the discovery of the bleaching-powder the cotton manufactures of Britain would never have attained their present development: nay more, had the British manufacturers been tied down to the old method of bleaching, they could not long have competed in the price of cottons with France or Germany.

To bleach in the old style, the first requisite is land, and that good and well exposed meadow-land. The cloth must be exposed for several weeks, and that only during summer, to sun and air, and must besides be constantly watered by hand. Now a single manufactory of moderate size near Glasgow bleaches, on the new system, on an average, 1400 pieces of cloth daily throughout the year. Let us only consider what an amount of capital would be required merely to rent the land necessary for bleaching in the old manner the enormous quantity of cloth, in the vicinity of this city, that would be indispensable, and we shall soon perceive that, with such burdens, the British manufacturer could not compete with his rivals on the Continent, where vast tracts of fine meadow-land might be had, distant from any great city, at a far cheaper rate, and in a more sunny climate. The superiority of our machinery would thus be, in one of the most important branches of industry, of such importance, that it may safely be asserted that but for the discovery of the bleaching-powder, which in its turn depends on those of sulphuric acid and of soda. I need not do more than allude to the use of the bleaching-powder in paper-making, which is one great cause of the superior quality and low price of paper in Britain.

Another important use to which the muriatic acid produced in the soda manufacture, and formerly thrown away, is now applied, is that of preparing cheap and superior glue from bones. Bones consist of bone-earth and glue; the former is readily dissolved by diluted muriatic acid, while the latter is left, and has only to be dissolved in warm water to be ready for use. The acid solution of the bone, put to the oven, is capable of being an admirable form of using that earth as manure. Professor Liebig, in his late valuable work on Agricultural Chemistry, has recommended this application. At present the solution in question is thrown away as useless in the glue manufactories.

The last application of sulphuric acid which I shall here mention is a very recent one, and one of the most scientific of the day, M. Gay-Lussac. It consists in its employment in the refining or purification of silver.

Silver, as it comes from the mines, is alloyed with one-half, or rather more, of copper. It also contains a small quantity of gold. It must be refined—that is, purified; and the pure or fine silver is then alloyed with the due amount of copper to form the standard or bullion silver.

Raw silver was formerly refined by cupellation, a process which cost about 35s. for 50 lbs. of silver. The gold contained in the silver would not repay the expense of extracting it, and was therefore allowed to remain, and to circulate in the silver, absolutely lost. But by the process of cupellation the gold is united with the silver in a non-convertible state. To separate the two is very costly; the expense of extracting the gold in the bullion is avoided; the silver is refined at a most trifling cost, and the gold is obtained by the same operation: may, even the copper, which was formerly lost, is now preserved; and although the gold only amounts from
tobooth to 1360th of the weight of the silver, yet as its value is about 14 per cent. of that of the silver, it not only repays the whole expense of refining but leaves a clear profit to the refiners. This beautiful application of chemistry has given rise to the singular and apparently anomalous result, that the seller of raw silver receives from the mint the exact quantity of pure silver which his alloy, on being tested, is found to contain, and likewise the whole amount of the copper present in the alloy, thus apparently paying nothing for the process of refining. The refiner is paid by the gold, which he retains, and which was formerly lost to every one. The saving effected by this improvement to the refiners is stated to have been enormous.

THE CUSTOM-HOUSE.

All the Western nations appear to have inherited from the Romans the practice of exacting certain payments on the landing and embarkation of merchandise at each seaport, and the name of customs, or of some equivalent term, shows that these payments were sanctioned by immemorial usage. These exactions aided the sovereign in his necessities, and induced him to encourage the commerce of his subjects. Rather more than a century afterwards Ethelred II. (A.D. 978-1016), in a council held at Wantage in Berkshire, fixed the toll or custom on ships and merchandise arriving at Billingsgate, which at that time appears to have been the principal landing-place in the port of London. It was declared that every smaller boat should pay one halfpenny; a large boat with sails, one penny; a keel (a ship, we suppose), four pennies; a vessel with wood, to give one piece of wood; a boat with fish coming to the bridge, one halfpenny or one penny, according to its size. After the Conquest customs were exacted not only by the king, but, at the outports, by the lord under whose protection the town was.

In 1559, in the first year of the reign of Elizabeth, steps were taken which may be said to have been the commencement of the present system of collecting the customs in London. It was ordered that "all creeks, wharfs, keys, lading and discharging places in Gravesend, Woolwich, Barking, Greenwich, Deptford, Blackwall, Limehouse, Ratcliffe, Wapping, St. Katherine’s, Tower Hill, Rotherhithe, Southwark, London Bridge, and every of them . . . . shall be from henceforth no more used as lading or discharging places for merchandises, but be utterly debarred and abolished from the same for ever." For "the better answering of the revenues of the queen," twenty quays and wharfs were appointed within the port of London, where alone merchandise and produce could be shipped or landed. Some were for all manner of merchandise; others for wine and oils; one for corn only; and Billingsgate was for fish, corn, salt, victuals, and fruit, but groceries were excepted. The owners of these twenty quays were required to give security that no goods should be laid on or shipped from their wharfs until the queen’s duties were paid, and that all ships were laden and unladen in the presence of the proper officers. The first three quays on the list are Old Wool Quay, New Wool Quay, and Galley Quay. Wool Wharf, or Customers’ Quay, is applied by Stow to one landing-place, which, he says, "is now of late most beautifully enlarged and built." The quays appointed as above are still known as the legal wharfs. They are all between the Tower and London Bridge. As the commerce of London increased, others were appointed, called “Sufferance Wharfs,” of which five were east of the Tower and eighteen on the Surrey side of the river.

The London Custom-house establishment of 1559 consisted of eight principal officers, each of whom had from two to six others under him, but the principal “Waiter” had sixteen subordinates. Until 1590 the duties were farmed for 20,000£ a year, but on the Queen’s government taking the collection of the duties...
in its own hand, they yielded about 30,000l. a year. The control of the government necessarily led to many improvements in the Customs establishment. The formation of the East India and other great trading companies during the latter half of the sixteenth century, and the growth of colonial commerce, augmented the trade of London and rendered the Customs a much more profitable source of revenue than they had yet been. From 1671 to 1688, according to D'Avenant, the first inspector-general of imports and exports, the customs of England averaged 555,752l. a year.

The old Custom-house, destroyed during the Great Fire, was replaced by one of rather more pretensions, which is said to have cost 10,000l., and was at least of more dignified appearance than the adjoining warehouses. In the fifty years after its erection the trade of the country had greatly increased, and from 1700 to 1714 the customs for England averaged 1,352,764l. each year. In 1718 the Custom-house was burnt down, doubtless not before it had been found very inconvenient for the transaction of the increased mass of business which had arisen out of a more wide and active commerce.

A new Custom-house soon arose on the site of the old building, in which the inconveniences formerly experienced were for a time remedied. The apartments of clergymen and accommodation for the greater number of clerks, so that the delays of which the merchants had before complained were obviated. The length of the building was one hundred and eighty-nine feet, and the centre was twenty-nine feet deep. The edifice was constructed of brick and stone, and the wings had a passage below the foundation. The fire was discovered running east and west; it was built of wood interspersed with chalk, with four high piles at each corner of the quay. Some of these piles were found mixed with chrysalids of water-insects; mussel-shells were found in different stages of decomposition; those lying at the south-east corner of the quay presented a greenish hue, inclining to the colour of verdigris, while those which were brought up from the depth of seventeen feet below the surface of Thames Street were nearly reduced to earth.

The owners of private property whose interests were invaded by the adoption of a fresh site demanded in the aggregate a sum of 84,478l., and by amicable arrangements and the finding of juries they were paid 41,700l. The old materials were sold for 12,400l.

It became, of course, an object of the first consideration to ascertain the nature of the substratum on which so large a pile was to be raised. Mr. Laing describes the character of the ground:—"Rising from the level of the river to the south side of Thames Street, the whole of the extent was discovered to have been formerly a part of the bed of the Thames. Quantities of rushes were found with chalk, and the foundations of some ancient houses were visible. This wall was supposed to be either part of the ancient defences of the city of London, or of some outwork, bastion, or barbican extending westward from the Tower." It was so strongly built, that even with iron wedges it was not broken without great difficulty; but it was necessary to effect this in order to form a sound foundation for the new building. This wall had been left in the meantime.

The preliminary difficulties having been overcome, the first stone of the new building was laid at the south-west corner by Lord Liverpool, then first lord of the treasury, on the 25th of October, 1813, and it was opened for business on the 12th of May, 1817. The northern elevation, fronting Thames Street, was plain and simple, but the south front, towards the river, assumed a more ornamental character, the central compartment projecting forward, and the wings having a hexastyle detached colonnade of the Ionic order. The attic of the central part of the building, comprising the exterior of the Long Room, was decorated with a series of allegorical figures representing the arts and sciences, commerce and industry, and characteristic figures of the principal nations with which Great Britain holds commercial intercourse. The dial-plate, nine feet in diameter, was supported by colossal figures of industry and plenty, and the royal arms were sustained by figures of ucar and commerce. The long room was one hundred and ninety-six feet by sixty-six. Unfortunately the foundation of the edifice gave way, notwithstanding the pains which had been taken to render it secure. In the Report of a parliamentary committee, in 1823, on the duties connected with the office of Works and Public Buildings, the failure of the building is somewhat harshly noticed. It is said that "the fraudulent and scandalous manner in which the foundation of the New Custom-house was laid, occasioned, by its total failure in 1823, a charge of no less than 170,000l. to 180,000l., in addition to the original expenditure of 255,000l." The total cost of the edifice, with the adjacent buildings together to nearly half a million sterling. The Long Room and the central part of the building were taken down and the foundations relaid, but the other parts remain as built by Mr. Laing. The figures just described, which decorated the principal front, were removed; but though there is greater plainness, the
simplicity is pleasing, if not majestic. As the breadth of the quay is not equal to the height of the building, it is not seen to advantage from that point, but the bridge or the middle of the river affords a better view. The river front is four hundred and eighty-eight feet in length, or ninety feet longer than the Post-office, and exceeding by thirty feet the National Gallery. The present time nearly one-half of the customs of the United Kingdom are collected in the port of London; and five or six years ago the proportion exceeded one-half. Not only is the immense business of its own port conducted at the London Custom-house, but the board of commissioners who sit there has all the out-ports in the United Kingdom under its superintendence. From them it receives reports, and instructions from its central board are issued to them in return. The Custom-house is one of the oldest sources of statistical information; and under the inspector-general of imports and exports, clerks are continually engaged in recording the facts and figures which illustrate the commercial movement of the country, the result of their labours being frequently printed and made known by order of Parliament.

Besides the warehouses and cellars, there are about one hundred and seventy distinct apartments in the Custom-house, in which the officers of each department transact their business. The object to be accomplished by the architect, and which, as he tells us, he kept constantly in view, was a judicious classification and combination of offices and departments so as to ensure contiguity and convenience, and at the same time to present such accommodation as was demanded by the peculiar purposes for which each was required. All the rooms are perfectly plain, with the exception of the Board-room, which is slightly decorated, and contains paintings of George III. and George IV., the latter by Sir Thomas Lawrence. The Long Room is one of the principal objects of interest, being probably the largest apartment in Europe of the kind. The length is one hundred and ninety feet, width sixty-six feet, and height between forty and fifty feet. It is not a gallery where the eye embraces at once the whole width and length, but here, as the architect has pointed out, the eye cannot take in both the length and width at the same time, and consequently is at fault as to the comparative dimensions. The present room is not so handsome as the one taken down after the failure of the foundation. The walls and ceiling are tinted to resemble stone, and the floor is of wood. The room is warmed by three very handsome stoves on Dr. Arnot's principle. The cellars in the basement form a groined crypt or undercroft, built in the most substantial manner, and fire-proof; the walls are of extraordinary thickness; and a temperature is constantly maintained having therefore disembarked, and tarried one day in the inns, on the morrow, horses having been prepared for us, we mounted and proceeded on our journey to the king, and arrived in Greenwich, a village in the neighbourhood of London, the capital of England. Here is built a small town, full of inns, and a certain fort stands erected for the protection of the harbour. Having therefore disembarked, and tarried one day in the inns, on the morrow, horses having been prepared for us, we mounted and proceeded on our journey to the king, and arrived in Greenwich, a village in the neighbourhood of London, the capital of England. Here is built a small town, full of inns, and a certain fort stands erected for the protection of the harbour.

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Those in the world, except Taprobane and Thule, by those who have formerly examined such matters, and to be triangular in shape. And that side which inclines towards the west and Spain measures seven hundred miles; and that towards the south and the opposite coast of France, which also is called Orontes, extends five hundred miles; so that towards the north and Germany is estimated to be eight hundred miles. And on the coast it has several cities of note, and forts, and towns; and amongst the cities indeed which are conspicuous and celebrated, are Antonia and Bristol, Danebium and Dartenicum, and London, which surpasses these; and the palaces which are in it in beauty and magnificence exceed the rest that towards the river flows through it, both great and navigable, having a very rapid current, for six hours flowing downwards, and again rising for six hours. . . . And a certain very large bridge is built, affording a passage to those in the city to the opposite inhabited bank, supported by stone cemented arches, and having also houses and towers upon it. And one may see ferry-boats and water-barks, which are rowed with speed, plying in great numbers on the banks, for the accommodation of the city. But merchants’ ships, which arrive in London from every country, ascend by the river to the city, and import wine and oil, and other articles of subsistence.

And throughout the city a large number of mansions, for the residence of the nobles, the merchants, and lofty halls ornamented with floral paintings, are erected. Also in some parts of the city very large royal palaces, ornamented in a very high degree, and luxuriously furnished, and encircled by gardens and parks, are pre-eminent. And the whole city is paved with flint stones. And a certain castle, being one of the most beautiful and strong, is built very near the river, having very many and large guns. Here the treasures and valuable property are deposited. For they are said to exceed the antiently famed wealth of Croesus and Midas, so vast a quantity of gold and silver is treasured up there. And near to Greenwich they possess an arsenal with dock-yards, where they build ships, it being close to the river. And in this city there dwell men from most of the nations of Europe, employed in various mercantile arts, such as the working of iron and other metals; added to which they execute with surprising skill the weaving of woollen cloths and richly embroidered tapestry.

And London, intemples and public edifices, and baths, surpasses all the cities of England. And where about the middle of the city a certain place is set apart, where there is daily an assemblage of merchants, from which there arise very extensive barterings and traffic.

Having given an account of our exports and imports, and the manner of transacting business with bills of exchange, Nicander tells us: “The city is in the highest degree well regulated, under the king and the other authorities, by regal and private laws. Wherefore also they pay to their king the greatest obedience. And they possess a peculiar language, differing in some degree from all others, having received contributions from almost all the rest, both in words and syllables, as I conjecture. For although they speak somewhat barbarously, yet their language has a certain charm or allurement, being sweeter indeed than that of the Germans and Flemish. As regards their manners and mode of living, ornaments, and garments, and vestments, they resemble the French more than others, and for the most part they use their language. And in feasts and drinking, and in pledges of health and carousals, they differ in nothing from the French. And their nobles and rulers, and those in authority, are polite with the vulgar; and elegant and good order, and are courteous to strangers. But the rabbles and the mob are as it were turbulent and barbarous in their manner, as I have observed from experience and intercourse. And towards the Germans and Flemish and Italians, and the Spanish also, they are friendly disposed; but towards the French they entertain not one kindly sentiment out of good will; and being very hostilely disposed, they are animated towards them with private and public feelings of enmity. Hence, too, some few only of the French merchants reside in the island, both because their kings, frequently without proclamation, wage on each other no trivial war, and it being doubtful if their residence shall be safe, wherefore indeed the French rarely dwell in London. The king seldom takes up his abode in the cities of note, but near smaller towns and other places, where palaces stand for the reception of himself and the grandees of his court; and in these he passes the greatest part of his time. And the whole body of life-guards, and all his revenue, and the state of grandees, and chief of the privy council, he always resides in lodges in the court; changing these daily, as is expedient, and receiving others of like stations, for administration of affairs pertaining to his government. And in London he appoints those called prefects, and administrators, who manage the affairs of the city. No sentence, however, inflicting capital punishment or fines of limbs, do they pass. And the kings, being perfectly independent, are always friendly disposed; but towards the French they entertain not one kindly sentiment out of good will, and being very hostilely disposed, they are not friendly disposed; but from some natural suspicion, which surpassesthesee, and the palaces which are in it in beauty and magnificence exceed the rest.”

Nicander gives a somewhat lengthy, though not very correct account of King Henry and his wives; and also of the hostilities between Francis I. and Henry. He descants largely on ecclesiastical affairs, and relates some interesting particulars respecting the suppression of monasteries; but our space will not permit us to make any further extracts from the ‘Travels’ of our quaint Corcyrean. We can give no explanation of his words, ‘The city is in the highest degree well regulated, under the king.’ “The city is in the highest degree well regulated, under the king and the other authorities, by regal and private laws. Wherefore also they pay to their king the greatest obedience.”
THE PLANÉ TREE.

As an English tree there is nothing in the history of the plane which can interest the imagination. No legendary tale has ever hallowed it as an object of veneration or regard, and no memories of old times cling around it. Its name excites no more emotion among the great majority of persons than that of the last horticultural novelty. If we follow to their native homes the two species of plane which are known in England, we shall in one case be led from the shores of Greece and the Levant, through Asia Minor and Persia; and, in the other, to the New World, over an immense tract comprising the Atlantic and Western States of North America, and the country west of the Mississippi, as far south even as Mexico, and northward as far as Canada. The former species is known as the Oriental Plane (Platanus Orientalis), and the latter as the Occidental Plane (Platanus Occidentalis). The Oriental Plane was introduced into England about the middle of the sixteenth century. Turner, who published a 'Herbal' between 1541 and 1568, had seen two very young trees, which he considers were either brought out of Italy, or of some far country beyond Italy, whereunto the friars, monks, and canons went a pilgrimage. The American Plane was introduced into the garden of Mr. John Tradescant at Chelsea about the year 1630; and it is this species which hitherto has been most generally propagated in England, though the late frosts of spring prove highly injurious to it, blighting the young buds, and giving a ragged appearance to the foliage. In its native soil, especially in warm and moist situations on the banks of the Ohio, it is one of the most magnificent trees of the forest. Michaux gives the dimensions of a specimen on an island in the Ohio, which at five feet from the ground measured forty feet four inches in circumference. There are fine trees of both species in the grounds at Lambeth Palace, in the Botanic Garden at Chelsea, and at Mount Grove, Hampstead, varying in height from seventy to ninety feet and upwards; and they are to be seen in many of the squares in London, but these are said to be chiefly the Western species. There are few old plane-trees in England, but one existing at Lee Court, in Kent, was mentioned by Evelyn in 1683. Some of the largest Occidental planes were killed by a severe frost in May, 1809, while the smaller ones were scarcely injured.

The plane may easily be distinguished by the singular appearance of the trunk, the old bark being thrown off in irregular portions, in consequence, as Dr. Lindley states, of its rigidity, by which it is prevented from stretching as the tree increases in diameter. The bark scales off to a less extent in the Oriental Plane than in the other species. They are also distinguished from each other by the form of the leaves, those of the Oriental Plane being the least indented. The seed-vessels, which hang suspended by long threads during
winter, in the form of little balls, are small, and of a rough and spiry texture in the Oriental, and comparatively smooth, and much larger, in the Occidental Plane. Both are of rapid growth, but the latter outstrips its congener. Mr. Loudon states ('Arboreten') that in the climate of London, under favourable circumstances, the Oriental Plane has attained the height of thirty feet in ten years, and in thirty years has arrived at the height of sixty or seventy feet. It is highly probable that the Western Plane, though it grows so rapidly, will cease to be cultivated, now that experience has so completely established its unfitness for our climate.

The wood of the planes is scarcely known in the useful or ornamental arts in this country. In the East it is said to be serviceable to the carpenter and cabinet-maker, being esteemed by the latter for its smoothness and the ease with which it is polished. The timber of old trees resembles the wood of the walnut. Michaux states that the wood of the Western Plane, when properly seasoned, is of a dull red colour, and that it is capable of receiving a finer polish than the beech; but it is fit only for furniture, as it is soon warped by the weather. Mr. Cobbett observes, in his 'Woodlands,' that chopping-blocks in the butchers' shops throughout the United States are almost universal. One of Wordsworth's beautiful Poems of the imagination, entitled 'The Reverie of Poor Susan,' is founded on an incident connected with the rush of that time, and of precisely the same character, produce cheese of very different degrees of excellence. This is owing to a difference in the economy of the dairy, and we mention it in order to draw attention to the remarkable similarity which exists among the whole of the cheese made in America, not only as regards quality and flavour, but in appearance. The characteristics of American cheeses consist in their greater diameter or breadth in proportion to their thickness; in their possessing their natural colour, little or no artificial colouring being employed; in their being full of holes or eyes; in possessing a pungent or rather bitter taste, and in a bandage of linen or cotton cloth being passed round their outward rim. In some matters the American cheese is clearly superior to those of other countries, and by no means inferior to those they have rejected or altered. Cheese-making may be considered one of these; and, as a consequence, they produce a quality of cheese decidedly inferior to our own.

The climate of the United States is by no means favourable for the making of either butter or cheese. Extremes of either heat or cold are equally injurious to the milk which is intended for cheese. Winter, however, is not the season for cheese-making either in this country or America, and consequently the milk during the summer months is neither exposed to a very low temperature. The economy of the American dairy is a little different from our own, since the whey and the butter-milk from which the cheese and butter have been extracted are of more value in America than in England. This is owing to the greater value of pork in America, in proportion to that of butter and cheese, pork being the best pork is frequently of higher value, weight for weight, than the best cheese; and some parts is nearly on a par with the price of butter.

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Few of the American dairies make more than one cheese during the day of twenty-four hours: the evening milk is deposited in pans (mostly of tin), and mixed with the morning's milk after the cream has been taken off it, a plan often adopted in some of our own dairies; and such cheeses are called two-meal cheeses; but since the temperature of the atmosphere during the hottest part of summer is at least from 6° to 10° of Fahrenheit higher during both day and night in America, the milk set up over-night gives but a very little cream, and there is less opportunity offered for robbing the cheese of its richest part.

It has been proved satisfactorily that the heat of the milk when the rennet is mixed with it, and it is set to coagulate, should not be over 85° or 87°; that the coagulation should not be too rapidly performed, and that when it has taken place, great attention should be bestowed upon the treatment of the curd. To these points but little attention is paid by the managers of American dairies: in the first place, the rennet is mixed with the milk while it is too warm, and too much of it is employed in order that the coagulation may be effected as speedily as possible, for during the process of coagulation the temperature of the milk undergoes hardly any perceptible change;

AMERICAN CHEESE.

Although a considerable quantity of American cheese has been imported into England during the last few years, it has scarcely found its way among retail dealers except in a few of our larger towns and cities, principally those having direct intercourse with America. More recently, however, there are exceptions to this; for in some of the market reports of inland towns we find mention made of American cheese. Like the Dutch cheese, its quality is in proportion to our own best varieties; but there are dairies in America which produce cheese of a better quality than that we are in the habit of importing from Holland.

It is well known that the quality of cheese greatly depends upon the management of the dairy; for in the dairying counties of England, dairy farms lying contiguous to each other, and of precisely the same character, produce cheese of very different degrees of excellence. This is owing to a difference in the economy of the dairy, and we mention it in order to draw attention to the remarkable similarity which exists among the whole of the cheese made in America, not only as regards quality and flavour, but in appearance.

The characteristics of American cheeses consist in their greater diameter or breadth in proportion to their thickness; in their possessing their natural colour, little or no artificial colouring being employed; in their being full of holes or eyes; in possessing a pungent or rather bitter taste, and a bandage of linen or cotton cloth being passed round their outward rim. In some matters the American cheese is clearly superior to those of other countries, and by no means inferior to those they have rejected or altered. Cheese-making may be considered one of these; and, as a consequence, they produce a quality of cheese decidedly inferior to our own.

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It has been proved satisfactorily that the heat of the milk when the rennet is mixed with it, and it is set to coagulate, should not be over 85° or 87°; that the coagulation should not be too rapidly performed, and that when it has taken place, great attention should be bestowed upon the treatment of the curd. To these points but little attention is paid by the managers of American dairies: in the first place, the rennet is mixed with the milk while it is too warm, and too much of it is employed in order that the coagulation may be effected as speedily as possible, for during the process of coagulation the temperature of the milk undergoes hardly any perceptible change;
while in our own cheese dairies, in the space of an hour or something more, which the milk is allowed to stand in order to give out all the curd, the temperature commonly sinks 4° or 5°, except in very warm weather, when 60° or 80° is the most approved state at the time the curd is broken down. The American treatment produces a peculiar pungent or bitterish taste; and in general too liberal an allowance of salt is employed, both in the curd and during the time the cheeses are being subjected to the press. Some of the dairy people will tell you that if the cheese were very mild, and but little salted, it would be impossible to keep it from the flies and maggots.

By the too rapid coagulation of the curd, and the complete breaking of it up by the hand, in order that it should quickly subside, the broken curd afterwards becomes hard and tough, and this is the chief cause of the cheese becoming so full of eyes. Neither is the management in the press according to the English plan; since where the cheeses are so thin as those usually made in America, less force is necessary to press them sufficiently; for if the curd is put into the cheese-vat saturated with whey, and immediately submitted to a severe pressure, not only is the whey and all other moisture expelled too rapidly, but some portion of the substance of the finest curd. Nor doubt the cheese ought to be well pressed, but the power should be in proportion to the material, and continued until the desired effect has been produced, by rather slow, but by sure means.

When the cheese has been submitted to the press for the last time, the outward rim or circumference is bound round with cotton cloth, the edges of the rim both above and below. This bandaging is done as a precaution against injury when sent to a distant market, and is rarely adopted except in large dairies; but where the circumference is so great in proportion to the thickness, it is certainly no bad plan to adopt.

The principal districts for cheese, or rather for such as has yet found its way to the English markets, are confined to the states of New York, New Hampshire, Connecticut, and Massachusetts. New York has the advantage of possessing some of the best grass lands in the United States; but the most noted cheese districts are confined to some of the grass farms bordering on the Hudson, Connecticut, and others of the smaller rivers; but it is with the 'Goshen' cheese of New York, something like what it is with the 'Stilton' cheese in this country, a small quantity only of that which bears the name is produced at or near the place from whence it derives its name.

The usual home price of the best American cheese is about six dollars the 100 lbs., or three pence sterlings the pound, and it is retailed at two or three cents more. It is true that various expenses are incurred in the route from the interior of the United States to this country, but surely the cheese which costs three pence per pound within fifty or sixty miles of the city of New York, might be afforded at double that price, or sixpence per pound, in the London market.

Love of the Tiger for Human Flesh.—It was my lot to be stationed, for several years, in a remote part of our Indian possessions, adjoining the Mysore frontier, and in the immediate vicinity of the great chain of Western Ghauts, the groves and thickets of their eternal forests, unTrodden by the foot of man, the tigress reared her young, and wandered with her savage partner into the smaller jungles of the plain, proving a scourgé everywhere of security from the humble dwellings of the wretched inhabitants. In such a country, inhabited by the poorest classes, living in small villages surrounded by jungles, and forced to seek their subsistence amongst the tiger's haunts, numerous casualties of course occurred, and I had frequent opportunities of studying the habits and dressing the pelts of this formidable animal. Some idea may be formed of the havoc committed by tigers, when I mention, from returns made to government, that, in one district, three hundred men and five thousand head of cattle were destroyed during three years! Whilst confined in the forest, the tiger is comparatively harmless. There, feeding principally on deer, he rarely encounters man; and when the solitary hunter does meet the grim tyrant of the woods, instinctive fear of the human race makes the striped monster avoid him. But in the open country he becomes dangerous. Pressed by hunger, he seeks his prey in the neighbourhood of villages, and carries off cattle before the herdsmen's eyes. Still he rarely ventures to attack man, unless provoked, or urged to desperation. But under whatever circumstances the blood is once tasted, the spell of fear is for ever broken; the tiger's nature is changed, he deserts the jungle, and haunts the very doors of his victims. Cattle pass unheeded, but their driver is carried off; and from that time the tiger becomes a man-eater.—Wild Sports of India.

Landed Property in Thessaly.—Occasionally we passed a piece of magnificent rice, in full ear at that early season, with straw the longest I ever saw in my life; while the number of wild pigeons that kept constantly rising out of these and other fields while we rode past them, was positively marvellous. The plain must be marshy in winter; but the whole of it might be easily kept dry enough for cultivation by a few cross-dikes, the parts which are cultivated being drained effectually in that manner. On passing one very magnificent piece of wheat, I observed incidentally to the surmise that it was in fine condition, and asked if he knew to whom it belonged. "How can I tell?" was his reply; "any one that can afford to watch and guard it may sow wherever he pleases; and when the time of harvest comes he may reap it, if it has not been stolen before and then some one pays him. It is the man who has had the crop sows somewhere else." "Then am I to understand that the land belongs to no one, and that any one may plough or sow where he pleases?" said I, somewhat surprised. "How can the land belong to any one?" asked the equally astonished Albanian. "If I sow corn there, the corn is mine; if you sow, it is yours; if I see good grass there, I feed my horses, or sheep, or oxen, if I have any; and any other person may do the same; but the land is not mine." But to whom then does it belong?" May I consider it turn out your flocks or sow seeds where you want to sow?" "Of course you may, if you can; but if I sow corn there, or feed my flocks there, I take good care to watch it, and not let you."—Captain Basil's Experiences in Albania.
DIAMOND CARRIERS.

The diamond was formerly obtained only from the East Indies, but the mines in this quarter are now nearly exhausted, and Brazil supplies not only Europe, but, in a great measure, Asia also. They are found in the beds of rivers in the district of Teuco, which is better known as the 'Diamond District.' At first the search was prosecuted by private adventurers, but the Government finally monopolised the business, and the whole district was placed under peculiar laws and regulations. If diamonds were found in gold washings, the adventurers were obliged to abandon the works to the Government, and very severe measures were adopted to repress the illicit search,—banishment to Africa, or imprisonment for life, with confiscation of property, being the punishment annexed to this offence; but these severe penalties could not repress a traffic which afforded so many facilities for evasion.

When Mr. Mawe, the mineralogist, visited the 'Diamond District,' about two thousand negroes were employed, divided into parties of about two hundred each, under a sub-administrator and overseers. The mode pursued was to turn the channel of the river in whose bed the precious stones were concealed, and, after removing the mud, to dig up the channel and move the materials, called cascalho, for washing. During the dry season, a sufficient supply is taken to occupy the negroes in the rainy months. The cascalho is laid in heaps of from five to fifteen tons, and it is now ready for washing, for which purpose water is carried by aqueducts, and means adopted for distributing it in the troughs where the operation is to take place. The method of washing is thus described by Mr. Mawe:—"A shed is erected in the form of a parallelogram, twenty-five or thirty yards long, and about fifteen wide, consisting of upright posts, which support a roof thatched with long grass. Down the middle of the area of this shed a current of water is conveyed through a canal covered with planks, on which the cascalho is laid two or three feet thick. On the other side of the area is a flooring of planks, from four to five yards long, embedded in clay, extending the whole length of the shed, and having a slope from the canal of three or four inches to a yard. This flooring is divided into about twenty compartments or troughs, each about three feet wide, by means of planks placed on their edge. The upper end of all these troughs (here called canoes) communicates with the canal, and are so formed that water is admitted into them between two planks that are about an inch separate. Through this opening the current falls about six inches into the trough, and may be directed to any part of it, or stopped at pleasure by means of a small quantity of clay. Along the lower ends of the troughs a small channel is dug to carry off the water." The earthy particles being washed away, the gravel-like matter remains, which is cleared first of the large, and next of the smaller stones, and the residue is then carefully examined. When a negro finds a diamond, he rises up and claps his hands, and one of the overseers receives the gem, all which are found during the day being taken at night to a superior officer, who weighs and registers them. A negro who finds a diamond weighing seventeen and a half carats receives his freedom, and premiums are given to the discoverer of smaller stones. To prevent collusion and concealment of diamonds, the negroes, at a given signal, remove into
IDENTITY OF PERSONS.

It is a most extraordinary phenomenon, that amid the countless myriads of human beings that have been created, a distinctive individual appearance should appertain to each one. The masses of mankind have, by original decree, or the influence of surrounding circumstances, become parcelled out into various nations, each having their peculiar characteristics, and features; but among none of these (not even the Jews and Pagans, in whom the practice of intermarriage has contributed to maintain a so remarkable general resemblance) have the marks of the personal identity of the individual been destroyed. Yet there exist some exceptions to this law of identity, and the consideration of some of these may prove not only interesting, but of practical utility.

Although, says Foderé, no two persons do exactly resemble each other, and, on close observation, a distinctive physiognomy may be observed, even in children (and twin children, too) of the same family; yet, the distinguishing traits of some individuals are either so slightly perceptible, or have become forgotten, and thus many persons have been known, without any interest in the matter, but purely through ignorance, to attest as true what was really false: fathers, husbands, and wives have been thus led away by illusions—erroneously denying or maintaining the identity of their children, or of each other.

Pliny devotes a section in the seventh book of his 'Natural History' to "Exempla Similitudinum." He says that it was hardly possible to distinguish Pompey the Great from the plebeian Vibiullus and the freedman Publicius; each of these persons resembling him so closely in his noble and generous deportment and handsome countenance. Cherus Scipio was nicknamed Serapion, from a striking likeness to a low slave of that name who sold animals for the sacrifices; while one of his descendants, and the consul Lentulus and Metellus, were each called after certain actors whom they so nearly resembled. A fisherman of Sicily resembled the provincial Sura, not only in features, but also in possessing a peculiar defect of speech. Cnemon sold to Antonius, when Triumvir, two children of a rare beauty and a perfect resemblance, although the one was born in Asia, and the other beyond the Alps. He passed them off as twins, but their language afterwards betraying the deception, Antonius reproached the seller with having obtained a far too enormous price for them. Another seller dealing in small diamonds, who had been advised that the very point which was considered a defect in these children, was, in truth, their highest recommendation; for while a resemblance between two twins could not be looked on as extraordinary, an example of its existence between two children, born even in different countries, was worthy of the highest commendation. Antonius, being by nature particularly curious, made the ressemble weighing five carats are worth from 1800. to 2000.; and those of six carats, from 2300. to 2500.

The art of cutting and polishing diamonds was unknown in Europe until 1456, when a young man named Bruges, constructed a polishing-wheel and used diamond powder as an abrasive. Besides the value of the diamond for ornament, it is employed in some of the useful arts, and the sale of bad or discoloured diamonds to be pulverised is said to be more extensive than the sale of brilliants. All other precious stones are cut and polished with the diamond; cameos, intaglios, and seals are engraved; and crystal for spectacles, agates for snuff-boxes, and window-glass are cut by it.

Mr. Mawe was shown the diamond treasury at Rio Janeiro, which contained from four to five thousand carats. The largest diamond yet known, which weighs one hundred and thirty-eight and a half carats, was discovered in 1791, in the Rio Abaité, adjoining the district of Tejuco. It is estimated at the standard at which small diamonds are valued, it would be worth 5,644.800. The following estimates of the commercial value of diamonds of good quality is by Mr. Mawe, who states that the prices are not subject to much fluctuation:—Weight from one to two and a half carats, 75. to 85. per carat; three to four carats, 85. to 95. per carat; five to six carats, 135. to 150. per carat: fine and well formed, 700. to 800. per carat; three carats, fine and well-formed, 700. to 800. per carat; four carats, 1000. to 1300. per carat; diamonds weighing five carats are worth from 1800. to 2000.; and those of six carats, from 2300. to 2500.

Mr. Mawe estimates the amount of diamonds in the treasury of Tejuco at 200.000 carats, in the Rio Janeiro, about thirty thousand carats. Mr. Mawe was shown a diamond weighing five hundred carats, from 1812.

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were examined, some of whom positively declared a few of these may prove interesting:

Russia has witnessed another impostor in more recent times. A Don Cossack, named Fugatcheff, having been sent to the camp with despatches, was observed by all the officers to bear a remarkable resemblance to the murdered emperor Peter. He resolved to turn this to good account, and having spent some time in Poland in perfecting his scheme, he returned to Russia in 1773, and by spreading the report that he was the emperor, who had escaped from the hands of the assassins, contrived to raise a considerable force among the Cossacks, and for more than a year maintained a most harassing warfare. At last his followers, disgusted with his cruelty and brutality, and stimulated by an immense reward, betrayed him to Count Panin, when he was taken in an iron cage to Moscow, and there executed.

In France several persons have personated the Dauphin, the son of the unfortunate Louis XVI, who died in prison during the reign of terror, but whom they declared to have escaped. Among these one Hersault, the son of a tailor, from his strong likeness to Louis XVI, was induced to pass himself off for his son of high birth. The two impostors were discovered by him, and induced, in spite of his repeated imprisonments, to pay him royal honours. He died in the Bicêtre in 1812. Some years after, another impostor, named Bruneau, excited considerable attention, and in 1818 was imprisoned for seven years.

The two celebrated instances of impostors which occurred in our own country during the reign of Henry VII., Lambert Simmel and Perkin Warbeck, are not cases in point, as they did not attempt to compass their ends by insisting upon the personal resemblance, but rather by natural address and a skilful employment of historical and family facts, which could only have been acquired from a careful tuition.

Cases of near resemblance are in fact of but little occurrence, and difficult questions of identity are frequently brought before courts of law, some of those which are upon record being of a very interesting nature. Decisions as to heritage and affiliation, nay, affecting life itself, have frequently depended upon the establishment of identity. In that rich repertory of legal lore, the Causes Celèbres, many remarkable cases of disputed identity are to be found: a brief notice of a few of these may prove interesting.

A noted example was determined by the parliament of Toulouse in 1560. Martin Guerre had been absent from home eight years, when an adventurer, named Arnaud Dutille, personated him, and took possession of his property: he had children by Guerre's wife, but neither she nor her sister and brother-in-law suspected the deceit for three years. Some suspicious circumstances then arising, the case was taken before the tribunals, when not less than three hundred witnesses were examined, some of whom positively declared that the accused was Guerre, others as positively that he was Dutille, while a third neither was able to distinguish the one from the other. The judges were reduced to the greatest perplexity, when the real Guerre appeared. The effrontery of Dutille well nigh disconcerted him, but upon direct personal comparison the wife and sister at once acknowledged him as their relative.

De Caille, a Protestant, fled into Switzerland at the revocation of the Edict of Nantes. His son died in his presence at Vervoi. Some years after, a marine and a Protestant, wishing to obtain the estate of Guerre's abjuration, set about to persuade De Caille, to whom he bore a great resemblance. He was prosecuted as an impostor. Some hundred persons testified as to his identity, among whom were women who had nursed De Caille's child, and old servants of the family. Public enthusiasm became excited in his favour, as it was stated that the opposition to his claims was put up by the Protestants in order to prevent him embracing the Catholic faith. Persons of consequence espoused his cause, and in vain were proofs offered that his true name was Mége, and that the young man whom he personated was really dead. He was put into the full possession of the estate, and shortly afterwards married advantageously. But here he carried matters too far, for he had already a wife, who, having hitherto connived at his proceedings in the hope of sharing in the spoil, finding herself duped and deceived, betrayed his secret. The case was now more carefully reinvestigated at Paris, when it was found that certain physical marks, known to have existed upon the young De Caille, were not to be discovered upon the impostor.

Two children belonging to a widow, named Le Moine, strayed away from home during her absence. About a year after, a mendicant came into the church where the widow was, leading by the hand a little boy. All the inhabitants of the vicinity, struck by his exact resemblance, declared this to be one of the lost children. The boy's mother, however, denied the identity, and induced, in spite of his repeated imprisonments, to have a scar on his forehead, and a mark on his neck, all which circumstances were observed regarding the prisoner. The two witnesses, however, distinctly swore that Hoag had a very visible scar upon the sole of the foot, produced by treading on a knife, but this mark did not exist upon the prisoner. He afterwards proved an ahibi.

One Redman was accused of robbing a Mr. Brown, and one of the witnesses, on cross-examination, said he knew a man, then in custody, who so resembled the prisoner, that he should not know the one from the other. These men were placed side by side in court, and every one was astounded at their exact resemblance. When the twin brothers Perreau were tried for perjury, their resemblance was so complete, that the accuser, who had been caught by one of the one or the other, did not know upon which of them to fix the charge. Dr. Montgomery mentions an instance of twins only to be distinguished by their parents by means of their dress.

The above cases would lead us to conclude that in all criminal trials the greatest caution must be em-
ployed in pronouncing upon cases of doubtful identity, and the melancholy fact that several innocent persons have suffered death through their identity having been mistaken, proves the absolute necessity of such caution.

Dr. Montgomery relates that a gentleman was robbed near Dublin, and a man placed upon his trial as the perpetrator, and convicted upon the prosecutor's testimony; but, owing to prior good conduct, he was recommended to mercy. A few days after, the gentleman was horror-struck at meeting in a road with the very man who had really robbed him. The error in this case seems to have arisen from the defective quantity of light, and the question has been mooted, as to what degree of light is essential to enable a witness to swear to identity. The French Institute decided, after numerous experiments, that the degree of illumination caused by the flashing of a pistol was not sufficient for this purpose. A Bow-street officer, however, identified a robber by this means in 1799; and Dr. Montgomery mentions an instance of a lady obtaining a sufficient view of a robber during a flash of lightning to be enabled to recognise him again.

Two men, named Clinch and Mackay, suffered death in 1797, for the murder of Mr. Fryer, their identity being being sworn to by Miss Fryer. Some years after, two thieves, executed for another offence, declared that there were Mr. Fryer's murderers.

Alluding to the case of Colman, who was unjustly executed for rape, Dr. Paris observes: "The melancholy case of Colman will impress my reader with the importance of carefully noticing the circumstances of dying declarations, lest, by receiving as evidence the ravings of delirium, or at least the imperfect impression of impaired faculties, the innocent should be sacrificed to the erring judge, and this is the more necessary in those cases wherein the atrocity of the crime committed creates an immediate prejudice against the party charged or suspected."

As on the one hand a person may be condemned through a mistaken identity, so, on the other hand, many circumstances may produce so great an alteration of the personal appearance, that a true identity may be denied. The brethren of Joseph knew him not, and Ulysses was only recognised by his dog. The learned Lacchias relates an instance of this:—Andrew Casali, a Bolognese nobleman, having been absent from his country for thirty years, was supposed to have died in battle, and his heirs took possession of his property. He returning from Italy, and claiming his rights, was sent to prison as an impostor. Indeed he was so completely changed in appearance, that his recognition was impossible: at this he was nowise surprised, since, having fallen into the hands of savages, he had sustained several years of cruel bondage. Lacchias, to whom the case was referred, decided that circumstances may so change the appearance that, to render it unrecognisable, and Casali was reinstated in all his rights.

Lacchias enumerates the various circumstances which may have an influence in producing this change. The effects of mere age, and of the increase or decrease of corpulence, are known to every one. The change of colour of the eyes, and of the hair, especially of the latter, is remarkable; thus, almost all children are born with blue eyes and light hair. Change of climate seems to have much effect in darkening or rendering grey the hair—the red colour longer resisting its influence, and after it the black. Intense grief may whiten the hair instantaneously, and this is said to have occurred to M. Antoine. But more remarkable is the case of a criminal, a fine young man, being condemned to death, his hair turned suddenly white. The emperor, when he saw this, thought his hair had been whitened artificially, or that some one had been substituted for the criminal; but on learning the genuineness of the change, he pardoned the man, saying that the dreadful moral convulsion he had undergone was ample punishment. Climate produces many other remarkable changes, as may the various ailments to which the absent person has been accustomed, or the different diseases from which he has suffered. Walter Scott has some lines in 'Marmion,' beautifully illustrative of this part of our subject:

"Danger, long travel, want and woe,
Soon change the form that man doth know:
For deadly fear can time outgo,
And blanch at once the hair.
Hard toil can roughen form and face,
And want can quench the eyes' bright grace,
Nor does old age wear such a case
More deeply than despair."

It must be allowed, then, that the establishment of identity is frequently a matter of infinite difficulty, and authors have not been able to lay down rules for so doing. Orfila considers that the condition of the hair may frequently aid in proving it; and as no putrefaction occurs in this structure, the mark is available after death. In general the declaration of the identity of dead persons is even more difficult than in the case of the living, so marked a change. Scars and cicatrices, original or mother-spots, and congenital malformations, form the most unexceptionable marks of identity.

Although the greater number of the narrations concerning suppositional children are the mere offspring of popular credulity and the love of the marvellous, yet in some cases the establishment of the identity of a claimant of an inheritance has been a matter of infinite difficulty. The Anglesey and Douglas cases are celebrated instances of this, that excited a vast degree of interest in the public mind during the periods of their agitation. Lord Mansfield, in delivering the judgment of the House of Lords in the latter, laid great stress upon the existence of a family likeness as one proof of identity. He says, "I have always considered likeness as an argument of a child being the son of a parent; and the rather as the distinction between individuals of the human species is more discernible than in other animals: a man may survey ten thousand people before he sees two faces perfectly alike; and in an army of a hundred thousand men, every one may be known from another. If there should be a likeness of feature, there may be a discrimation of voice, a difference in the gesture, the smile, and various other characters; whereas a family likeness runs generally through all these; for in everything there is a resemblance, as of features, size, attitude, and action." In respect to family likeness, Dr. Gregory used to relate the following anecdote:—Being called to a rich nobleman, residing in one of the provinces of Scotland, he was struck with the exact resemblance the form of his nose bore to that of a portrait of the Grand Chancellor of Scotland in the reign of Charles I. In walking through the village next day, he observed the same configuration in several of the inhabitants, and the nobleman's steward informed him that all these persons were illegitimate descendants of the Chancellor.

SPRING BALANCES.

The spring-balance is a machine in which the elasticity of a spring of tempered steel is employed as a means of measuring weight or force. One of the simplest kinds of spring-balance is that which, when employed as a weighing-machine, is known as the spring or pocket steel-yard. It consists of a helical
Spring-balances with helical springs are applied to several useful purposes besides that of ascertaining the weight of bodies. A spring of this character is sometimes used to hold down the lever of the safety-valve in a steam-engine boiler, the movement of the index also showing the pressure of the steam. Such an apparatus is especially useful in a locomotive engine, the shaking motion of which might degenerate a valve loaded with moveable weights. A helical spring-balances forms also a good scale-stopper. When applied to the measurement of muscular force, the tractive power of a locomotive carriage, &c., one end of the cylinder in which the spring is enclosed is made fast to an immovable object, and the power to be measured is applied to the sliding-rod. If used to ascertain the force necessary to draw a carriage, the spring is placed between the carriage to be drawn and the power employed to draw it. In using a spring-dynamometer for this purpose, especially when the carriage is moved by animal power, some inconvenience is occasioned by the index itself; for, in order to hold the sliding-rod in the force applied, to remedy which Mr. H. R. Palmer contrived an apparatus in which the quick vibration of the spring is checked by means of a piston moving in a cylinder filled with oil. A very narrow space is allowed for the oil to pass between the edge of the piston and the cylinder, so that a considerable resistance is opposed to the motion of the piston and the springs, and the index consequently represents the mean amount of force applied without being affected by sudden variations.

The ingenious method adopted by Mr. Martin for transmitting the motion of a spring to an index moving upon a circular dial-plate, is applicable to spring-balances of other than the helical construction. It was used by M. Hanin, a French gentleman, who was rewarded by the Society of Arts, in 1790, for an apparatus for showing at one view the weight of an object according to several different scales or systems of weights. His machine, which is described and figured in the ninth volume of the Society's 'Transactions,' consists of a dial-plate, on which are marked several concentric circles, divided according to the systems of weights used in different countries, and an index moved by a rack and pinion, as before described. The spring, instead of being of a helical form, is semicircular; its upper extremity being firmly attached to the back of the dial-plate by means of screws, while its lower end is attached to the hook which carries the weight, and the sliding rack by which the index is moved. Marriott's patent weighing-machine is very similar to that of M. Hanin, but the spring is a perfect ellipse, with its longer axis laid horizontally. The weight to which the rod is attached, is fastened by a nut and screw to the middle of the upper side of the spring; and the rack, with the hook which holds the article to be weighed, to the corresponding point on the lower side of the spring. The spring, rack, and pinion are enclosed in a circular box at the back of the dial-plate, the periphery of which serves as a stop to prevent the spring from being overstrained. A similar apparatus, contrived by M. Regnier, has been used as a dynamometer, as well as a weighing-machine.

A scale-plate or dish may be added when necessary to any of the spring weighing-machines which have been described. On account of the absence of weights, and the great simplicity of their application, spring-balances are very useful in cases where extreme accuracy is not required, especially when a portable weighing-machine is desirable. Machines for ascertaining the weight of the human body are often made on this principle, a kind of chair being suspended from the spring. —From the Penny Cyclopedia.
NING-PO

The events now occurring in China give, at the present moment, a temporary interest to places of that singular empire, of which, being political and warlike, our peaceful pages cannot avail themselves; but we may be allowed to hope that the painful though perhaps necessary proceedings now occurring may tend to produce a more pleasing interest, and a more lasting association with districts capable of maintaining a mutually beneficial intercourse with ourselves, and by no means undeserving of our attention from their own importance, apart from that derived from the energetic display of British power and valour.

One of such places is Ning-Po, the principal port of the province of Che-Kiang, situated about seventy miles east-south-east from Hang-Chow, the capital of the province, at the termination of the grand canal from Pekin, and about fifty westward of Chusan. The province is one of the most fertile in China, and is "the very centre of the silk manufactures and of tea cultivation, the two great staples of British trade in China." (Davis's "Sketches.") Black tea is produced chiefly in this province and the neighbouring province of Fo-Kien; and the cultivation of the mulberry is carefully attended to, the leaves of the young trees being found to be most favourable to the superiority of the quality of the silk.

Ning-Po is situated on the right bank of the Tahe or Ning-Po river, about fifteen miles from its mouth, which is protected by the fortified town of Chin-Hae, recently taken by the English. The port is good; and the river, though it has a bar at the entrance, has a depth of fourteen feet to the walls of the city. The town is enclosed with walls of freestone, but which, according to Gutzlaff,* though massive, were overgrown with weeds, and in a state of decay; it has five gates, two on the east, where is the port, as also two water-gates, for the barks in and out of the city by means of the canals, of which it has several. The other three gates are in the other three sides; while a floating bridge, upwards of a thousand feet in length, formed of sixteen flat-bottomed boats, bound together with iron chains, connects the eastern front with the suburb on the opposite side of the river: this bridge was broken through in the late attack upon the town. Ning-Po is about five miles in circumference, and is said to contain 300,000 inhabitants. The streets are mostly narrow, as in all the towns of China, and appear to be more so from the overhanging penthouses of the shops, of which the town is full, some of the streets being also ornamented with triumphal arches. Gutzlaff, who was here in 1832, says, "We passed a broad street, well lined with the most elegant shops, which even exceed those of Canton. European manufactures, as well as Chinese, were here displayed to much advantage. Mirrors and pictures also, with the most splendid silks, embellished and decorated the scene;" and he adds, that Ning-Po "surpasses anything Chinese which we had yet seen, in the regularity and magnificence of the buildings, and is behind none in mercantile fame." Much of the trade of the port arises from the intercourse with the Japanese, to whom they convey their silk, receiving in return gold, silver, and copper. The Chinese also who have emi-

* "Journal of Three Voyages along the Coast of China in 1831, 1832, and 1833," by Charles Gutzlaff. These voyages were undertaken in trading-vessels, but Mr. Gutzlaff had for his peculiar object the conversion of the Chinese to the Christian faith.
grated to Siam and Batavia carry on a similar commerce to a considerable extent. A great number of junks are also built at Ning-Po.

The mandarin to whom Mr. Gutzlaff addressed himself on the subject of his mission, received him courteously, although the inhabitants, on coming up to the river, he says, "looked very disdainfully and repeatedly called us black devils." He and his attendants were provided with a lodging. "We crossed a floating bridge, and arrived at the leang-kung, Fukkeen hall. This was an extensive building, with spacious rooms, adorned with Chinese pictures and idols. A very sumptuous supper was served up in the evening, and every attention shown us to make us comfortable. We were fully sensible of this uncommon degree of kindness, and made no remarks upon the dirty room where we were to pass the night. In front of it were different idols, all gilt; one of them was inscribed with the name of the emperor, and received his regular supply of incense with much more attention than his neighbours. The populace of the town also, though curious and noisy, were far more decorous than their river-side fellow-countrymen.

The river above, or, according to Gutzlaff, within the town divides itself into two branches, which are then called the Yao and the Kin, neither of which supplies fresh water. The district watered by these streams is the Garden island of Duhalde.

"These rivers water a plain surrounded almost on all sides with mountains, and form a sort of an oval basin, whose diameter from east to west (drawing a line across the city) may be about ten or twelve thousand toises, the Chinese toise being, as I have already said, ten feet: that from north to south is much greater. The river above, which serves to water a garden for its luxuriance and cultivation, is full of towns and houses, and divided by a great number of canals made by the waters which fall from the mountains; the canal, upon which one part of the suburbs is situated, to the foot of the mountains, is separated into three branches, and is about five or six thousand toises long, and six or seven broad."

"Within this extent of ground there are reckoned sixty-six canals on the right and left sides of the principal one, some of which are broader than the principal itself. This vast quantity of water, conducted with art, renders the plain exceeding fruitful, and causes it to yield two crops of rice; besides the rice, they also sow hemp, which is said to thrive well here. There may also be observed a great number of trees which bear tallow (the Croton sebifera).

"The air is also everywhere wholesome, and the country pleasant and open. The sea supplies a great quantity of fish, all sorts of shell-fish, and good lobsters. Among others, in the beginning of summer, they catch a fish called huang, that is to say, the yellow fish, which are much sought after on account of their delicate taste; but as they will not keep long out of water, they take care to put them into glasses, and by this means transport them throughout the empire."

"Below the town," says Gutzlaff, "the banks of the river are so low that dykes are very necessary; the whole region, with the exception of long ridges of sterile hills, is highly cultivated. It was the time of wheat harvest, and all the people were in the fields cutting the corn, which this year amply repaid them for their labour. Even in the houses of the peasants we remarked more comfort and neatness than in the parts we had hitherto visited.

In 1736 it was attempted to make Ning-Po a station for the British trade; but, as is remarked in Milburn's 'Oriental Commerce,' the oppression the English traders were subject to compelled them to abandon it. The recent capture of Ning-Po may perhaps enable the project to be realised on more equal terms than could else have been obtained, and we may venture to hope that the benefits arising from the introduction of a higher and more humanising civilization, may compensate the unfortunate sufferers, and their posterity, for the evils inflicted upon them by war.
much occupied with party objects to cultivate science and literature, or pursue with success any important and extensive acquisitions. Correspondents, even in this period, both of manners and events, are scanty and doubtful. "There is," observes the writer just referred to, "no part of English history since the Conquest so obscure, so uncertain, so little authentic or consistent, as that of the wars between the two Roses. All we can distinguish with certainty through the deep cleavages which separated that period, is bloodshed, savage manners, arbitrary executions, and treacherous dishonourable conduct in all parties."

It was during these civil broils, i.e. in the reigns of Henry VI., Edward IV., and Richard III., from about 1440 to nearly the close of the century, that the Letters which form the title of this article were written; and they are undoubtedly among the most vivid and interesting record of the times to which they belong. They are not so much the letters of statesmen and politicians, as it is remarked in the introduction, as of men and women occasionally of course mixed up with public affairs, but treating of them only as affecting their private interests. The authenticity of these documents is established in the clearest and most satisfactory manner. They record the words of the very men of the particular persons of the family of Paston, in Norfolk. The originals were carefully preserved in that family for several descents, and were finally in the possession of the Earl of Yarmouth, their lineal descendant, with whom the male line of the house terminated. They then became the property of that great collector and antiquary, Peter le Neve, Esq., from whom they devolved to Mr. Martin, by his marriage with Mrs. Neve, and were part of his collection purchased by Mr. Worth; from whom, in 1774, they came to Sir J. Fenn. Sir John published them in four volumes, quarto; two in 1787, and two in 1783. From this edition the present one is taken; and its object is to present in a cheap and popular form the most vivid and interesting portion of the past, such as is simple and accessible for matters of very valuable and importance. The parts which have been considered doubtful, are not altered, but the spelling is modernised; and thus the letters are open to the easy perusal of such persons as would be deterred by the uncouth and repulsive orthography of the old mode of writing:

The writers of these letters had no intention of being either party objects, but the picture of the times in which they lived; and yet they have, in a very important sense, become both. We hold that history to be the best and the most useful which pictures the most distinct and graphic form the human life of that period to which it refers. The dates of battles and the intrigues of faction are far inferior in value and in interest to the knowledge and honest then actually lived, thought, and expressed themselves; what were their occupations, amusements, and business; how they were prepared for, set about, and discharged their several callings and duties; what was the influence they exerted; how they acted and were acted upon. To enable us to form a just conception of the vast system of human life as it has existed at different times, we would have some idea of the aspects it has assumed, the springs by which it has been moved, and the results to which it has been directed, is the great office of history. We care not whether they are public documents and records, or private letters from persons of no historic name; if they give us this information, or any portion of it, in the same degree are they valuable and important, and belong to the best and purest sources of history. As such we are inclined to rank the correspondence now under consideration. It is from persons for the most part who achieved no name and no reputation beyond the days in which they lived, but such as constitute a great and important part of the vast mass of breathing and moving humanity. Its subjects are principally connected with the business and transactions of common life, such as for the most part are either at home or in the existing transactions; with those occasional and rapid allusions to personal and political events which persons interested in such matters, or in some way affected by them, but not writing expressly upon them, would naturally make. Human feelings, affections, and passions, with the things that excite and move them; men's serious affairs; their humbler interests, their lighter occupations, their courtships, their marriages, their superstitions, their festal observances, their conversation, and the like, are disclosed in the frank and undisguised intercourse of an epistolary communication. Matters of more weighty and general interest, again, are put before us; not by formal descriptions, but by the more vivid and simple expression of personal adventure and experience: an individual gives his version of the affair, the part he took, and the things which befell him therein. In this manner trials at law, proceedings in parliament, with specimens of parliamentary eloquence, elections, battles, riots, insurrections, successively pass in review.

Most of the events which constitute the history of the period are referred to, more or less, in these Letters; and it is frequently, as far as evidence of such events in the letters of the particular persons of the family of Paston, in Norfolk. The originals were carefully preserved in that family for several descents, and were finally in the possession of the Earl of Yarmouth, their lineal descendant, with whom the male line of the house terminated. They then became the property of that great collector and antiquary, Peter le Neve, Esq., from whom they devolved to Mr. Martin, by his marriage with Mrs. Neve, and were part of his collection purchased by Mr. Worth; from whom, in 1774, they came to Sir J. Fenn. Sir John published them in four volumes, quarto; two in 1787, and two in 1783. From this edition the present one is taken; and its object is to present in a cheap and popular form the most vivid and interesting portion of the past, such as is simple and accessible for matters of very valuable and importance. The parts which have been considered doubtful, are not altered, but the spelling is modernised; and thus the letters are open to the easy perusal of such persons as would be deterred by the uncouth and repulsive orthography of the old mode of writing:

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frailty maketh you to fall, beseech his mercy soon to call you to him again with repentance, satisfaction, and con-

trition of your heart, never more in will to offend him.

"Secondly, next him above all earthly things, to be true liegeman in heart, in will, in thought, in deed, unto the king our aldermost (greatest) high and dread sovereign lord, to whom both ye and I be so much bound to; charging you as father can and may, rather to die than to be the contrary, or to know anything that were against the welfare or prosperity of his most royal person, but that as far as your body and life may stretch, ye live and die to defend it, and to let his highness have knowledge thereof in all the haste ye can.

"Thirdly, in the same wise, I charge you, my dear son, alway as ye be bounden by the commandment of God to do, to love, to worship your lady and mother: and also that ye obey alway her commandments, and to believe her counsels and advices in all your works, the which dread not but shall be best and truest to you. And if any other body would steer you to the contrary, to flee the counsel in any wise, for ye shall find it naught and evil.

"Furthermore, as far as father may and can, I charge you in any wise to flee the company and counsel of proud men, of covetous men, and of flattering men, the more especially and mightily to withstand them, and not to draw nor to meddle with them, with all your might and power; and to draw to you and to your company good and virtuous men, and such as be of good conversation, and of truth, and by them shall ye never be deceived nor repent you of.

"Moreover, never follow your own wit in no wise, but in all your works, of such folks as I write of above, ask your advice and counsel, and doing thus, with the mercy of God, ye shall do right well, and live in right much worship, and great heart's rest and ease; and I will be to you as good lord and father as my heart can think.

"And last of all, as heartily and as lovingly as ever father blessed his child in earth, I give you the blessing of Our Lord and of me, which of his infinite mercy increase you in all virtue and good living; and that your blood may by his grace from kindred to kindred multiply in this earth to his service, in such wise as after the departing from this wretched world here, ye and they may glorify him eternally amongst his angels in Heaven."

"(To be continued.)

THE PILLOWY.

The public exposure of offenders, as a punishment, was common in England before the Norman conquest, and was in frequent use from that period until within the last thirty years. The Saxon name for the pillory (halsfang, literally catch-neck) indicates the manner in which it was used as an instrument of punishment. The form of the pillory in use in England in the reign of Henry VII. is given in a collection of prints published by the Society of Antiquaries; and in Douce's 'Illustrations of Shakspere' there are no less than six
The following cut, from Fox’s ‘Martyrs,’ represents Robert Ockham standing in the pillory in the reign of Henry VIII. The pillory of later days did not differ much from those of ancient date. It usually consisted of a wooden frame or screen, raised several feet from the ground, behind which the culprit stood, supported upon a platform, his head and arms being thrust through holes in the screen, so as to be exposed in front of it; and in this position he remained for a definite time, sometimes fixed by law, but usually assigned at the discretion of the judge. The form of the judgment was, that “the defendant should be set in a pillory for some days or weeks.” The pillories in France (for in France, as well as in most other countries in Europe, the pillory was in use for many centuries), was an octagon stone building, but the upper part was of wood, and turned round on a pivot, in order that offenders who were sentenced to stand in it might be exposed on every side to the assembled spectators.

There were pillories in England which turned round in a similar manner to the one at Paris. The punishment of the pillory was liable to many objections. The temporary ebullition of popular favour or indignation might either render the punishment a sort of personal triumph, or a severe and brutal public retaliation. In 1812 a person of the name of Eaton, an aged man, sentenced to the pillory for an irreligious libel, was pelted with filth and missiles, and lossof life has sometimes resulted from the rough treatment of the populace. In 1759 an under-sheriff of Middlesex was fined 50L. for allowing Dr. Syncrude, who was believed to have contaminated the public water, to be attended upon the platform by a servant in livery, holding an umbrella over his head, and the neck and arms of the offender were not confined in the pillory. The functionary, it is to be presumed, acted from motives of political sympathy, and could not be induced to execute the sentence impartially.

As a punishment for dishonest millers and bakers, or fraudulent debts and perjuries, the punishment might be in accordance with men’s moral feelings, and it would have been difficult to have extracted from them any sympathy for a delinquent convicted of these offences. But when the pillory was applied to offences arising from differences of opinion, the efficacy of the punishment was at once destroyed, and the instrument of ‘demoralised,’ to use an expression of a member of one of the revolutionary committees in the French revolution when the guillotine had been for some time incessantly and recklessly in operation. Prynne and other men of eminence were pilloried during the political struggles of the seventeenth century. Selden narrowly escaped the same fate, and De Foe’s ironical pamphlet, entitled ‘The Shortest Way with the Dissenters,’ subjected the author to the treble punishment of fines, imprisonment, and the pillory. On one day he stood in the pillory before the Royal Exchange, on Cornhill; on the second day, near the Conduit, in Cheapside; and on the third day, at Temple-Bar. De Foe says that “the people, who were expected to treat him very ill, on the contrary pitied him, and wished those who set him there were placed in his room, and expressed their affection by loud shouts and acclamations when he was taken down.” But he had a more signal triumph than this. With that lively temper which never deserted him during a long life of mingled successes and ill fortune, he occupied himself during his imprisonment in writing a ‘Hymn to the Pillory,’ which was very extensively read at the time, and has been reprinted on occasions when offenders sentenced to the pillory have been censured by the warmth of public sympathy. Addressing the instrument which was intended to degrade him in the estimation of his fellow-citizens, De Foe says—

“Thou art no shame to truth and honesty, Nor is the character of such defaced by thee, Who suffer by oppressive injury. Shame, like the exhalations of the sun, Falls back where first the motion was begun: And he who for no crime shall on thy brows appear, Bears less reproach than they who placed him there,"

The publication of this poem, and its extensive circulation, must have proved a bitter pill to the enemies of De Foe. We extract a few more lines to show the triumphant spirit in which it is conceived: the allusion to Selden has already been explained:

“This poem, frequently reprinted, must have hastened the abolition of the punishment. In 1816 the law was so far altered that the only offenders which were punishable by the pillory were perjury and subornation of perjury, and in 1837 the use of the pillory was abolished altogether. With other penal corrections which have, a tendency to degrade, the character, the pillory has been discontinued in most parts of Europe. To the present generation in England it is as much an obsolete punishment as the cucking-stool for scolds. Whipping at the cart’s tail, another relic of a barbarous period of criminal jurisprudence, is equally obsolete. The whipping of females, either in public or private, was abolished in 1820; and in 1841, out of seventy thousand adult prisoners committed in England and Wales, only three hundred and eighteen were subjected by their sentences to corporal punishment, and these were carried into effect in the presence only of proper officers within the walls of the prison.”
THE ARTIFICIAL LIGHT OF RUDE NATIONS.

In the accounts given to us of rude and partially civilized nations by travellers, we find repeated mention made of fire-brands, formed of a strip of resinous wood, being used for the purpose of artificial illumination. This use has been made of the roots of many trees, and the use of them, when torn into strips, for light, are illustrated at this very time in the Western Isles of Scotland, and the western parts of Ireland, where roots of fir, found in the peat mosses, are dug up, torn into strips, and applied to this purpose.

The manufacture of torches, intended expressly for purposes of illumination, is a second step in the progress. These probably consisted, in the first instance, of staves of combustible wood coated with resin. From the writings of many of the early authors, it would appear that torches made in this way were very common among the Greeks and Romans; indeed Pliny expressly says as much. In the poems of Homer, when artificial lights are alluded to, they appear generally to have been torches. Thus the great hall in the palace of Menelaus at Lacedaemon, which is represented as having been exceedingly splendid, was lighted by torches placed in the hands of statues; the hall of Ulysses in Ithaca was lighted by three braziers filled with billet-wood, assisted by some torches; and the图为 the Pope represented as working her web by torch-light. A substitute for the resinous wood would be a rope or assemblage of hæmpen fibres, dipped in tar or some resinous substance. When or by whom this form of torch was introduced, does not clearly appear; but it seems to have been used in many countries. Such were the cases in Japan more than a century ago; for the lanterne, which is itself derived from the Latin laterna, are plaited like ropes, and have knots in them: when a light; while those who prefer the name lanthorn, the in a watch to a knot, which marks a particular annex the idea of the horny material of which these lamps and torches were lighted.

Resinous oil is known in very early ages in rude nations in the rudest stages of civilization. The Esquimaux, and Kamchatdais use the same oil as an article of food and a source of light. It was most probably accidents which first showed that if the oil can be separated into distinct filaments, by allowing it to ascend between small parallel fibres, it can be kindled and kept burning by a very small quantity of air. From this ascent of the oil is traced to the action of capillary attraction, is one of the results of modern science; but the fact itself was doubtless known from the first use of oil as an illuminator. The vast numbers of earthen lamps dug up in every country which was once under the Roman yoke, indicate the prevalent use of those articles eighteen or twenty centuries ago. Beckford has collected many allusions, in the classic authors, to the use both of lamps and of torches at the public illuminations of the Egyptians, the Romans, and other early nations. There was a particular festival of the Egyptians, during which lamps were placed before all the houses throughout the whole country, and kept burning the whole night. During that festival the Jews called the Feast of the Dedication of the Temple, which was celebrated in December, and continued eight days, a number of lamps were lighted before each of their houses. At Rome, the forum was lighted when games were exhibited in the night-time; and Caligula, on a late night, after Catiline's conspiracy had been defeated, lamps and torches were lighted in all the streets in honour of him. The emperor Constantine caused the whole city of Constantinople to be illuminated with lamps on Easter-eve.

Whatever might be the material or the form of the vessel, or whatever fibrous substance may have been used as a wick, if liquid oil constituted the inflammable ingredient, the instrument was a lamp; indeed the rude lamp is the lantern of the Arabs, and the "solar" lamps of our own country, are but the two extremes of a chain, the links of which are all on the same principle. But when the inflammable ingredient is solid, the instrument partakes more or less of the nature of a candle. The 'Natural History' of Pliny affords evidence that both the name and the use of candles were known to the Egyptians. These candles appear to have been made of strings dipped in resin or coated with wax; and these strings were afterwards superseded by wicks made of a thin roll of papyrus, or of a common rush from which the rind or outer skin had been peeled off. So simple is the art of making a candle, that any nation which had the means of procuring animal tallow, spermaceti, wax, or other inflammable substance, another being the solid form at common temperatures, would be likely to use such substance for the purpose, in addition to or in lieu of lamps fed with oil.

Lanterns or lanthorns have been used in various countries and from remote times, for protecting lights from the action of the wind. We are told that Epicurus's lantern was sold for three thousand drachmae, and that Diogenes's lantern was held in high estimation among the ancients. It would not be unreasonable to ask which is the proper mode of spelling this name; but the etymologists afford very little aid in the inquiry: one says that the name comes from the French lanterne, which is itself derived from the Latin laterna, which is an instrument which signifies, "to light." Another exhausts the meaning of lanterns of various materials, and the idea of the horny material of which these instruments are frequency made. Horn lanterns were first introduced into England by King Alfred, about the year 887, in order to preserve his candle time-measureurs from the wind. In some places glass, and in others oiled paper, are used for lanterns. In China, according to Mr. Davis, large lanterns of a cylindrical shape are hung on either side of the entrance gateways of houses, on which are inscribed the name and titles of the inhabitant of the house, so as to be read as well by day as by night, when the lantern is lit. In speaking of Roman lanterns, Lactantius says: "Among the principal ornaments are the varied lanterns of silk, horn, and other materials, which are suspended from the roofs, adorned with crimson tassels, but which for purposes of illumination are so greatly behind our lamps, and produce more smoke than light."

WINDSOR, AS IT WAS.

My earliest recollections of Windsor are exceedingly delightful. I was born within a stone's throw of the Castle-gates; and my whole boyhood was passed in the most unrestrained enjoyment of the venerable and beautiful objects by which I was surrounded, as if they had been my own peculiar and proper inheritance. The king and his family lived in a plain barracks-looking lodge at his castle foot, which, in its external appearance and its interior arrangements, exactly corresponded with the humble taste and the quiet domestic habits of George III. The whole range of the castle, from its carriage, and its market, to its houses dedicated to the especial pleasures of a school-boy. Neither warden, nor sentinel, nor gamekeeper interfered with our boisterous sports. The deserted courts of the upper
quadrangle often re-echoed, on the moonlight winter 
in the play-ground of the terrace! Away we 
and looking along a channel cut in the surface, I saw the dome of 

"The stately brow of Windsor's heights, — "

nor could I bid the stranger

"Th' expanse below of grove, of lawn, of meal survey.""

My thoughts, then, were all fresh and vivid, and I could 

"All creeping creatures, venomous and low," might crawl over and under each other.

The park I what a glory was that for cricket and 

no one molested us. The beautiful plain 

might crawl over and under each other.

The park I what a glory was that for cricket and 
kite-flying; no one molested us. The beautiful plain 

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kite-flying; no one molested us. The beautiful plain 

Nor could I bid the stranger
Emigration.—Many thousand persons every year leave the United Kingdom for some one or other of the British Colonies, in most of which an industrious man may establish himself in comfort and plenty with more certainty than he could do if he remained at home. If a man is unable to maintain his position in society, it is right that every facility should be extended to him to assist him to make up his fortune by proceeding to some other part of the British empire. One of the most effective methods of doing this is the publication by proper authority of authentic information concerning the different colonies, in order that the intending emigrant may comprehend, as far as possible, the new circumstances in which he is about to place himself. He should know, for example, the rate of wages, the prices of provisions, of raw produce and manufactured articles, and the kind of labour for which there is a demand; and the climate of each colony, its distance from England, &c., are highly necessary points to be considered. By legislative regulations respecting emigrant ships, passengers may be protected in their position, and the voyage rendered as agreeable as possible. A public board, appointed by government, called the "Colonial Land and Emigration Commission," has recently been reconstituted and by its means the officers act under the immediate jurisdiction of the Government. The practical duties of the Commissioners may be divided under three heads:—1. Sale of Colonial Lands. 2. Superintendence of Emigration. 3. Diffusion of Information in respect to Westminster. They are enabled to contract for the sale of waste lands in certain of the Colonies. They furnish the parties depositing money in this country with certificates of payment available for the purchase of land in the colony, and apply the money to the conveyance of emigrants nominated by the depositors. They have no authority to perform this office in respect of lands situated in the North American Colonies. 2. Whenever persons of the labouring class proceed to the colonies at the public expense, it is directed to the Commissioners to see, first, that they have not been induced to emigrate by publications improperly representing the advantages which await them; next, that they are of the description required in the colony to which they are going; thirdly, that they are forwarded in vessels fit for the voyage, and that they board a sufficient supply of provisions, water, and all other articles requisite for the health and comfort of the passengers. When the expense of emigration is defrayed by private funds, it belongs to this Board, as far as possible, to protect the poor from imposture, and from the effects of improvident expense. The Commissioners have power to demand and receive from those persons who come to them for advice on the subject of emigration, such information as may be adapted to their particular cases. Government emigration agents are appointed in different parts of the United Kingdom. The practical duties of the Colonial Land and Emigration Commissioners, and the following is a summary of their duties:—They correspond with any magistrates, clergymen, parish officers, or others who may apply to them for information as to the facilities for emigration from any particular part of the United Kingdom. They give, gratuitously, information as to the sailing of ships, and means of accommodation for emigrants; and whenever applied to for that purpose, they see that all agreements between shipowners, agents, or masters, and intending emigrants, are duly performed. They also see that the provisions of the Passenger's Act are strictly complied with, viz., that passenger-vessels are sea-worthy, that they have on board a sufficient supply of provisions, water, medicines, &c., and that they sail with proper sanitary precautions. They then attend personally at their office on the day of embarkation, and generally they afford, gratuitously, all the assistance in their power to protect intending emigrants against fraud and imposition, and to obtain redress where oppression or injury has been practised on them. There are also government emigration agents in the colonies.
LOCAL MEMORIES OF GREAT MEN.

THOMSON.

T o be popular, in the best meaning of the word, that is, to be universally read and understood long after all temporary tastes or influences have ceased to act, be the best test of a poet's genius, then must we place the author of the 'Seasons' high indeed in the intellectual scale. His works are everywhere, and in all hands. Some portion of this popularity may perhaps be attributed to the circumstance that he is never too deep for his readers; without being by any means a superficial writer, his excellencies lie so much on the surface, that there is as little danger of their being overlooked as unappreciated. And these excellencies may be chiefly described as resulting from an exquisite apprehension of the characteristics of external nature. "There is no writer who has drunk in more of the inmost soul of his subject. If it be the object of descriptive poetry to present us with pictures and visions, the effect of which shall vie with that of the originals from which they are drawn, then Thomson is the greatest of all descriptive poets; for there is no other who surrounds us with so much of the truth of nature, or makes us feel so intimately the actual presence and companionship of all her hues and fra-
grances. His spring blossoms and gives forth its beauty like a daisied meadow; and his summer landscapes have all the sultry warmth and green luxuriance of June; and his harvest fields and his orchards hang the heavy head" as if their foliage were indeed embrowning in the sun; and we see and hear the driving of his winter snows as if the air around us were in confusion with their uproar."

The scenes in which Thomson was born, lived, and died, were all in fine harmony with his works, possessing the same variety of beauty and grandeur, and for the most part calculated by their traditional and historical memories to nourish a poet's mind. From the beautiful pastoral country, with its undulating surface and romantic rivers and woodlands, Roxburgh, in which he was born (September 11, 1700), and where he spent his boyhood, he removed to Edinburgh, where the leisure hours that could be spared from the University were spent in wandering about the magnificent neighbourhood of the city, and made an observatory. Thomson had been about two years at this place when his father, a clergyman, died, and his mother, with the rest of the numerous family, came to join James, in order the better to eke out their scanty income while he remained at his studies. At Edinburgh the first rude conception of the 'Seasons' appeared in a poem entitled 'The Two Books of Life, by a Student of the University;' but if the poet had placed much reliance on this essay, he must have been sadly disappointed. The next effort was somewhat more successful. Mr. Hamilton, the divinity professor of the University, having given Thomson the 119th Psalm as an exercise, he made, though in prose, so poetical a paraphrase of it, that the professor and the author were alike surprised and charmed. The former, however, thought it necessary to warn him that his views were bound up with the ministry, less imagination and a plainer style would be advisable. A little circumstance, however, enabled the poet to adopt the wiser course of doing his best to develop the powers God had bestowed upon him. Some gentlemen saw or heard read the paraphrase in question, and informed the young author's dreams of ambition were almost always more or less connected. He says—

"When on the margin of the briny flood,
Child'd with a sad preacing damp I stood,
Took the last look, ne'er to behold her more,
And mix'd our murmurs with the wavy war,
Heard the last word; fall from her pious tongue,
Then, wild into the bulging vessels hung,
Which soon, too soon, convey'd me from her sight,
Dearer than life, and liberty, and light!"

The young poet's first entrance to London promised, as it has done to so many of his brethren, more than for a long time was realized. He had brought with him some letters of introduction, tied up in a handsome packet, from his friend, which introduced him to influential circles, and in various ways assisted the young poet, whilst preparing for his first important publication. This was Mr. Forbes, the Countess of Hertford, to whose intercession Savage, the author of the 'Seasons,' was indebted for his life. Thomson once spent some month at the country-seat of this lady, but, according to Mr. Whateley, author of 'Observations on Modern Gardening,' drew attention to it; the poem did the rest of its work, and brought the poet many new friends and patrons, if it brought him little money. He received for 'Winter' the sum of just three guineas. 'Summer' followed in the next year, 'Spring' in 1728, and 'Autumn' in 1730. 'Spring' was dedicated to the Countess of Hertford, to whose intercession Savage was indebted for his life. Thomson once spent some months at the country-seat of this lady, but, when he saw his friend Johnson, he seemed to enjoy carousing with her lord so much better than talking with her, that he was never again invited. We must not quit the 'Seasons' without remarking that Thomson adds another instance to the illustrious list of authors, from Shakespere downwards, who have shown the value of continual efforts at improvement. To the original edition of the 'Seasons' no less than nine hundred and sixty new lines have been added. Thomson's ambition now aimed at the drama. In 1729 the tragedy of 'Sophonisba' appeared, with moderate success. By the critic it was looked on rather as a moral lecture, in a dramatic form, than a genuine play, and the less refined part of the audience having unfortunately caught up a somewhat ludicrous one,—

"O Sophonisba, Sophonisba, O!"

there was often irrepressible laughter where the poet had looked for tears. A parody of the original,—

"O Jimmy Thomson, Jimmy Thomson, O!"

ran through the town to the poet's deep mortification. Subsequent literary efforts may be briefly dismissed. He wrote two or three other plays, with more or less of success, but none of them add to the reputation of the author of the 'Seasons.' The most popular of them was 'Tancred and Sigismunda,' but even that is now never acted, and probably not often read. The 'Castle of Indulgence,' on the contrary, the last piece published in the author's lifetime, is only less popular than the
It was Thomson's custom to walk from his residence in Kew Lane to London, when the weather rendered a water conveyance ineligible. On one of these occasions, on reaching Hammersmith, tired and over heated, he imprudently took a boat for Kew. A severe chill seized him, which his subsequent walk did not remove; the next day he was in a state of high fever. He got better; but one fine evening he was tempted to expose himself to the dew, before quite recovered, and the effect was fatal. He was buried in Richmond Church, where Lord Buchan subsequently placed a brass tablet, with an inscription, and some lines from 'Winter.' A monument to his memory was erected in Westminster Abbey in 1792. His house at Richmond fell into the hands of Mrs. Boscawen, a lady who purchased it as a fitting place for her and her company; her appreciation of the great memory of the place, by the strictest preservation of whatever had become associated with the poet's name. She replaced the little seat, on which he had so much loved to sit, in its original place, in the retired part of the garden, and hung votive tablets around it to his honour. There, too, she set up his bust, with the simple but eloquent words,—

"Here Thomson sung
The Seasons and their change."

In an alcove she placed the little old-fashioned table on which Thomson had been wont to write. Here also was set up an inscription, somewhat florid certainly, but truly that of the man. An exhibition, a covering for both the poet and the man:—"Within this pleasing retreat, admired by no mortal, the music of the nightingale, which warbled in soft unison to the melody of his soul, in unaffected feeling of nature, he painted their images as they rose in the day, and poured the whole profusion of them into the imitable 'Seasons.' Warmed with intense devotion to the Sovereign of the Universe, its flame glowed through all his compositions. Animated with unbounded benevolence, with the tenderest social sympathy, he never gave one moment's pain to any of his fellow-creatures,—save only by his death, which happened at this place on the 27th day of May, 1748."

THE PASTON LETTERS.

[Concluded from p. 108.]

ONE of the most curious documents in these volumes is a catalogue of a gentleman's library, John Paston's, in the time of Edward IV. It contains nine volumes, each consisting of several tracts or books bound together. The books are principally poetry and action; with a little history, a little law, a little religion, and a good deal of heraldry. There are, however, two tracts of Cicero's among them, 'De Senectute,' and 'De Amicitia.' An accident of time has betaken this inventory, which has a good deal diminished its interest. It was written on a strip of paper and rolled up, one sheet following another. At this time the common wages of a clerk were 20s. 6d. As books were then both scarce and dear, the shelves of the good divine could be but scantily furnished. One of the letters a bill of expenses for the transcription of books is preserved. Printing had but just then been invented, and transcription was at the time a regular occupation. The price was twopence for writing a folio leaf; several of which might be done in a day. For transcribing a 'Treatise of War, in four books,' containing sixty folio leaves, the expense was ten shillings. At this time the common wages of a mechanic were sixpence a day; the price of wheat, a
shilling the bushel; of barley, fivepence; and oats, sixpence. So that the cost of copying a volume of one hundred and twenty pages was equal to that of ten bushels of wheat, or about four pounds of our present money. The actual value of the book would of course be greater; for in addition to the charge for transcription there would be the paper, binding, and profits of the trade to take into the account. But one printed volume in put down for the catalogue of J. Paston's library. Writing was then in its infancy, books were rarely seen, and reading was the occupation or the amusement of the very favoured few. Nevertheless a considerable advance had been made on the literary accomplishments of those times when bishops and nobles used a cross for their autograph. Writing had become general among the higher and middle classes; and a taste for reading was beginning to show itself. One W. Worcester is mentioned — and we are not to suppose that he stood alone—who had diligently applied himself to literary pursuits, had "bought divers books," and was as "glad and feyn of a good book as Master Fastolf would be to purchase a fair mill."

It appears again, from a letter of Margaret Paston, that ignorance in the mysteries of domestic management. Agnes Paston was evidently most anxious about the welfare and fortunes of her family, and active and determined in promoting them; but she held the reins of parental discipline with a tight and resolute hand. Her treatment of her daughter when grown to woman's estate appears excessively harsh and cruel. She was almost deprived of liberty, and beaten once or twice a week in the course of economy. Margaret Paston, the daughter-in-law of Agnes, writes, that the latter was of a far kinder, more generous, and excellent nature. Her good feeling, affectionate disposition, and attention to the welfare of others show themselves in every part of her correspondence. Her solicitude for poor thoughtless John of Sparham, as displayed in the following extract, puts her character in a very pleasing and admirable light:

"I am afraid that John of Sparham is so schyttl (light) witted, that he will set his goods to mortgage to Heydon, or to some other of your good friends, but if (unless) I can hold him in the better, ere ye come home; he hath been arrested since that ye went; and hath had much sorrow at the suit of Master John Stokes of London for ten marks (6l. 13s. 4d.) that Sparham owed to him; and in good faith he hath had so much sorrow and heaviness, that he wist not what he might do. I feel him so disposed that he would have sold and have set to mortgage all that he hath, he had not roth (cared) to whom, so that he might have had money to have holpen himself with; and I entreated him so that I suppose he will neither sell nor set to mortgage, neither cattle nor other goods of his, till he speake to me. Be he supposed that I will goe to him is at the request of the parson of Sparham and Knatysele. I suppose it is alms (charity) to comfort him, for in good faith he is right heavy, and his wife also; he is not now under arrest, he hath paid his fees, and goeth at large; he was arrested at Sparham, of one of Knatysele's men."

We cannot refrain from inserting an extract from another of this lady's letters. It is addressed to one of her domestics when from home, and refers to the placing of her son at the University. It is alike admirable for sense, taste, and excellent feeling. Her anxiety for the morals, learning, and respectability of her son speaks for itself. He was to be "coupled with a better than young Holler." and also, but at the same time, she directs, with true feminine delicacy, that "he should make never the less of him," because he was a countryman and a neighbour:

"Wherefore I pray you heartily, if it be no disease to you, that ye will take the labour to bring Walter where he should be, and to purvey for him that he may be set in good and sad (sober) rule, for I was loath to lose him, for I trust have more joy of him than I have of them that be older; though it be more cost to me to send you forth with him, I hold me pleased, for I wot wel ye shall best purvey for him, and for such things as is necessary for him, than another should do, after mine intent. As for any horse to lead his gear, methink it were best that ye purvey at Cambridge, lest than (unless) ye can get any carrier from thence to Oxford more hastily, and I marvel that the letters come not to me, and whether I may lay the default to the father or to the son thereof. And I will Walter should be coupled with a better than Holler's son is there, as he shall be; howbeit I would not that he should make never the less of him, by cause he is his countryman and aneighbour; and also I pray you write a letter in my name to Walter, after that ye have known mine intent before this to him ward; so that he do well, learn well, and be of good rule and disposition, there shall nothing fail him that I may help with so that it be necessary to him; and bid him that he be not too hasty of taking of orders that should bind him, till he be of twenty or thirty years of age or more, though he be counselled the contrary, for often rape (haste) rueth. I will love him better to be a good secular man than a lewd (ignorant) priest."

We might say more about these volumes, and produce more passages from them; but enough has been written and extracted to illustrate the character and interesting nature of their contents. The arrangement of the letters in the present edition, the abbreviation of those which required it, and the additional notes appended by the editor, are well and judiciously executed.
MODERN BRIGANDS.

MODERN Italy, though unhappily never wholly free from brigands, has not seen such numerous and formidable associations as those of Marco Sciarra and the other great robber chiefs that flourished in the fifteenth and sixteenth centuries. The nearest approach to them, in point of numbers and in boldness, has been made, not in the Roman states and on the frontiers of the Neapolitan kingdom in the Abruzzi—that promised land of robbers, where some bands, however, have never been wanting—but in Calabria and in the great plain of Apulia, in the most southern province of the kingdom of Naples, and near the shores of the Adriatic. As in the olden time, these formidable bands were favoured by the political disorders of the country, by foreign invasion, insurrection, revolution, and frequent changes of government; and from the same circumstances they were equally enabled to mix and confound in the popular eye the characters of robber and patriot. Though in a very backward state of civilization, the Calabrians were living, on the whole, happily enough among their mountains, and the Apulians on their plains, when the armies of the French republic, at the end of the year 1798, after occupying the States of the Church, crossed the frontier of the kingdom to plant the red cap of liberty in Naples, to drive out the old Bourbon king Ferdinand, and to establish an affiliated republic, which lasted not quite six months. Then, while the court retired under English protection to Sicily, the Calabrians flew to arms. Instead of a general, the king sent them over a priest, the celebrated Cardinal Ruffo, a member of the ancient house of Ruffo Scilla, whose estates lay in Calabria, and whose principal castle, until dismantled and ruined by the terrible earthquake of 1780, stood by the rock of Scilla, the ancient Scylla, right opposite to Charybdis, on the Sicilian shore.

No sooner had the Cardinal raised the Bourbon banner at that extremity of the Calabrias, than at the call of legitimacy and Holy Faith—"Ferdinando nostro e la Santa Fede"—thousands flocked to it, and swore to purge the kingdom of unbelieving Frenchmen and Jacobins, and restore their lawful sovereign. Among these multitudes were some men who were already nothing more nor less than brigands; but they had arms in their hands, were daring, active, and better acquainted with that wild country than any other class, and these were not times for the Cardinal to be very particular as to the morals of his followers: it was enough for him that they would march and fight. Ruffo enrolled them all, and marched rapidly forward for Naples, where the French force, under General Championnet, was very inconsiderable; and as he advanced, his bands were gradually swelled by tributary streams that dropped in from the mount-

[Brigands.—From Pine'll.]
tains. Unhappily this march of the army of legitimacy and holy faith, headed by a prince of the holy empire, was marked with blood and plunder. Rufo himself was no butcher, as he has been represented, but he could establish no discipline among the plundering and rapacious soldiers of thse rude men, always quick and fierce, now were excited almost to madness. We knew the Cardinal well in his old age, and a shrewd and clever, but most amiable old man, he was. Wherever a town had shown any attachment or subserviency to the republicans, the Santa-Fedisti made it run with blood; and murder and plunder were not always confined to such obnoxious places. The bitter propensities of the ill-conditioned mountaineers led them to commit similar excesses even upon people who were as good royalists, or at least as good Catholics as themselves. As the Cardinal was passing through the last defile of Calabria, he learned that some royalist partizans had taken the field in Apulia, and were making fierce war upon their own countrymen of the French or republican party. He therefore turned aside in that direction, reducing on his march all the broad province of Basilicata, for everywhere the common people were enthusiastic royalists. With the army of the Faith still further increased by volunteers from the Basilicata mountains, Rufo descended into the plain of Apulia, and a great slaughter was made of the important city of Altamura, which was defended by a strong republican garrison. The Cardinal erected an altar where other commanders would have raised a battery, and every morning he celebrated mass to his devout army, dressed in his purple and full pontificalibus. He read the prayers for the dead for all that fell on his side, and gave his benediction, with proper sanguinary events in the country and districts as perturbation of the French and their republican allies before Mammon began his war of extermination.

We have ourselves studied the history of these summary events with the country and in the districts which were more particularly the scenes of them; and it appeared to us that all parties were about equally bloodthirsty, and that there was little to choose, as to the qualities of moderation and mercy, between the French generals Duhesme, Broussier, and the native Neapolitan republican general Ettore Caraffa, and the royalist partizans or brigands, Alate Proni, Frà Diavolo, Mammano, and the rest. During their in-brief ascendency and triumph, the French and their partizans had hunted down the royalists like wild beasts, and had committed detestable atrocities at San Severo, Bovino, Andria, and many other places in Apulia, and on the confines of that extensive province. Ettore Caraffa, who was Count of Ruvo, and eldest son of the unfortunate在家人的and Carafa, and the magistrate of the Republican, gaetano barcella, a distinguished man of state, and a distinguished administrator of the Neapolitan army, when the French took the king's presents, collected another band, some of the members of which had been robbers before or became regular brigands afterwards. Frà Diavolo was vindictive and cruel, but this miller Mammano was a fiend incarnate, as great a monster and shedder of blood as Benedetto Mangone, whose career and catastrophe we mentioned in the preceding paper. He never spared a man of a French or in his power; it is said, that during this terrible civil war he butchered with his own hand four hundred Frenchmen and Neapolitans of the republican faction; that it was his custom to have a bleeding human head placed on the table when he dined, in the place where persons of better taste love to see a vase of flowers; and that, when in his most excitable state, he would drink the warm gushing blood of his victim, and incessantly strove in a sort of victory.

Other armies of the Faith, each of them including a certain number of daring and lawless ruffians, had either taken the field before or begun operations now. A priest of the Abruzzi—the far-famed Abate Proni—drove the French from his native mountains, marched through the Abruzzi and Capitanata, traversed the deep forests of Monte Gargano, and descended the plain of Apulia, collected a great many of the hordes of banditti, and the Parisi, and the generalissimo of all the armies of the Faith. A robber of Itri, a rude little town perched on the mountain of St. Andrea, near the frontiers of the Roman States, who had obtained the name of Frà Diavolo, or Friar Devil, turned royalist partisan, and so infested the high-road between the river Garigliano or Liris, and Terracina, that no French convoys or detachments, unless very strong, could pass—that not a courier or letter could go one way or the other unless escorted by a little army. Frà Diavolo and his men always occupied the deep defiles through which the road runs for several miles; and while they were hid among the rocks and thickets, their scouts, chiefly their women, who excited no suspicion, were posted along the road on either side to give notice of the approach of any travellers. These women, in their picturesque dresses, were always seen with their distaffs in their hands, walking along, singing and spinning their flax, apparently engaged in the most innocent of occupations; it was pleasant to the eye to meet them, and not unpleasant to the ear, for their sweet and often liquid and musical air, was pleasing to the wayfarers and prayed the Blessed Virgin to accompany them; but too many Frenchmen, and too many travellers who were neither French nor Jacobins, found to their cost that it would have been better for them to have met dragons or she hyenas in their path. A few miles from Itri, the head-quarters of Frà Dia- volo, in the same province of Terra di Lavoro, Gaetano Mammonne, a miller of Sora, a pleasant little town on the Garigliano, collected another band, some of the members of which had been robbers before or became regular brigands afterwards. Frà Diavolo was vindictive and cruel, but this miller Mammonne was a fiend incarnate, as great a monster and shedder of blood as Benedetto Mangone, whose career and catastrophe we mentioned in the preceding paper. He never spared a man of a French or in his power; it is said, that during this terrible civil war he butchered with his own hand four hundred Frenchmen and Neapolitans of the republican faction; that it was his custom to have a bleeding human head placed on the table when he dined, in the place where persons of better taste love to see a vase of flowers; and that, when in his most excitable state, he would drink the warm gushing blood of his victim, and incessantly strove in a sort of victory.

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by the pass of Rovino, the French generals and the republican government at Naples issued such orders as had scarcely been known in modern Europe, except in La Vendée. Every town or city that resisted the republic was to be burned and levelled with the ground—the cardinals, the archbishops, the bishops, the curates, in short all the ministers of religion were to be held guilty of the rebellion of the places where they dwelt, and punished with death—every rebel to the republic was declared to be guilty of death, and every accomplice, whether a layman or a priest, was to be treated as a rebel and principal—wherever the tocsin was rung from the church towers, the priests of the place were to be punished with death—every one that circled in the streets of Naples as a common rebel—there was no inquiry or trial. The zaroni of the city joined the Calabrians and Apulians, and surpassed them in cruelty; and when the court returned from Sicily (Queen Carolina was more king than her indolent careless husband, and was sister to Marie Antoinette, queen of France, whom the French republicans had so barbarously executed), special orders were issued by Pope Clement, and the victors in battle were treated as rebels. The French army was the only legible body of men in Europe, and the republic was declared to be a rebel and guilty of death; and finally, in all cases the punishment of death was to carry with it the forfeiture of goods and property of every kind. In spite of this black manifesto the Cardinal continued his march, and, after defeating the republicans in the suburbs, entered Naples as a conqueror. People were burned alive; and in the fights that ensued the most horrid atrocities were committed. The Army of Faith and the mob had begun. Several of the partisan chiefs, though of such questionable reputations, received regular commissions. Provisi was made a colonel, and so was the monster Mainmone. It is even said that Frà Diavolo, a brigand by profession, received a colonel's commission, and, like the rest of the French army, was permitted to do as he pleased. The personal character of the French did a great deal towards giving the turn to public opinion. His unconquerable perseverance, which some properly enough called obstinacy—his simple habits, so flattering to the John Bullism of the day—his straight-forward and earnest piety—and the case with which he appeared to put off the farmer, and put on the soldier,—each stroke of these qualities were exceedingly powerful. The French were carried over, and after some hard fighting the republic was beaten. Napoleon, when, as was the case with France, upon the manifesto of the Duke of Brunswick, "the land brièled," The personal character of the French did a great deal towards giving the turn to public opinion. His unconquerable perseverance, which some properly enough called obstinacy—his simple habits, so flattering to the John Bullism of the day—his straight-forward and earnest piety—and the case with which he appeared to put off the farmer, and put on the soldier,—each stroke of these qualities were exceedingly powerful. The French were carried over, and after some hard fighting the republic was beaten. Napoleon, when, as was the case with France, upon the manifesto of the Duke of Brunswick, "the land brièled,"

WINDSOR, AS IT WAS.

[Concluded from page 112.]

THE late king and his family had lived at Windsor nearly thirty years, before it occurred to him to inhabit his own castle. The period at which he took possession was one of extraordinary excitement. It was the period of the threatened invasion of England by Napoleon, when, as was the case with France, upon the manifesto of the Duke of Brunswick, "the land brièled." The personal character of the French did a great deal towards giving the turn to public opinion. His unconquerable perseverance, which some properly enough called obstinacy—his simple habits, so flattering to the John Bullism of the day—his straight-forward and earnest piety—and the case with which he appeared to put off the farmer, and put on the soldier,—each stroke of these qualities were exceedingly powerful. The French were carried over, and after some hard fighting the republic was beaten. Napoleon, when, as was the case with France, upon the manifesto of the Duke of Brunswick, "the land brièled."

Napoleon, when, as was the case with France, upon the manifesto of the Duke of Brunswick, "the land brièled."

He passed onwards towards St. George's Chapel. But the military pomp did not end in what is called the upper quadrangle. In the lower ward, at a very humble distance from the regular troops, were drawn up a splendid body of men, ycleped the Windsor Volunteers; and most graciously were the nods of royalty to the well-known drapers, and hatters, and booksellers, who had the honour to join in the commissions in that distinguished regiment. The salutations, however, were short, and onwards went the cortège, for the chapel bell was tolling in, and the king was always punctual.

I account it one of the greatest blessings of my life, and a circumstance which gave a tone to my imagination, which I would not resign for many earthly gifts, that when I lived in a place where the cathedral service was duly and beautifully performed. Many a frosty winter evening have I sat in the cold choir of St. George's Chapel, with no congregation but two or three gaping strangers, and an ancient female or so in the stalls, lifted up to heaven by the peals of the sweetest of organs, or entranced by the divine melody of the Nunc dimittis, or of some solemn anthem of Handel or Boyce, breathed most exquisitely from the lips of Vaughan. If the object of devotion be to make us feel, and to carry away the soul from all low and earthly thoughts, assuredly the grand chaunts of our cathedral service are not without their use. I admire—none can admire more—the abstract idea of an assembly of rea-
mity was a portion of the make-believe of those ages when the people were equally trampled upon by the victor and the vanquished. When, too, in the daily service of St. George's chapel I heard the words, "God bless our gracious sovereign, and all the knights companions of the most honourable and noble Order of the Garter,"—though I thought it was a little impious paraphrase of the solemnity before the footstool of the Most High, I still considered that the honourable and noble persons, so especially prayed for, were the choicest portion of humanity—the very "salt of the earth"—and that heaven would forgive this pride of its creatures. I saw the Installation of 1805; and I hated these words ever after. The old king marched erect, and the Prince of Wales bore himself proudly (he did not look so magnificent as Kemble, in Coriolanus); but my Lord of Salisbury, and my Lord of Chesterfield, and my Lord of Winchelsea, and half-a-dozen other lords—what a frightful spectacle of fat, limping, leaden supporters of chivalry did they exhibit to my astonished eyes! The vision of "thrones of knights and barons bold" fled for ever; and I never now raise my shoulder.

But I am forgetting my old Sunday at Windsor. Great was the crowd to see the king and his family return from chapel; for by this time London had poured forth its chaises and one, and the astonished inmates of Cheapside and St. Mary Axe were elbowing each other to see how a monarch smiled. They saw him well; and often have I heard the disapproving exclamation,—"Is that the king?" They saw a portly man, in a plain suit of regiments, and no crown upon his head. What a fearful falling off from the king of the story-books!

The terrace, however, was the great Sunday attraction,—and though Bishop Porteus remonstrated with him, he would send people to crowd together and bands to play on these occasions, I cannot think that the good-tempered monarch committed any mortal sin in walking amongst his people in their holiday attire. This terrace was a motley scene:

"The peasant's toe did gall the courtier's glee."

The barber from Eton and his seven daughters elbowed the Dean, who rented his back parlour when he was in the city,—and often I have heard of a man who would have been satisfied to stand in the front rank for a smile of majesty, having heard that the bishop of Chester was seriously indisposed. The prime minister waited quietly amidst the crowd, till the royal party should descend from their dining-room,—smiling at, if not unheeding, the anxious inquiries of the stockbroker from Change Alley, who wondered if Mr. Pitt would carry a gold stick before the king. The then expressing these in a common mill, when the oil given out has all the scent of the flower which has been made use of. The plan adopted is, to place on the ground a layer of the flower, about four inches thick and two feet square; over this are placed some of the Tel or Sesamum seed wetted, about two inches thick, and two feet square; on this again is placed another layer of flowers, about four inches thick, as in the first instance; the whole is then covered with a sheet, which is held down by weights at the ends and sides. In this state it is allowed to remain from twelve to eighteen hours; after this the flowers are removed, and other layers placed in the same way; this also is a third time repeated, if it is desired to have the scent very strong. After the last process, the seeds are taken in their swollen state and placed in a mill; the oil is then expressed, and possesses fully the scent of the flower. The skins called dubbons, and is sold at so much per vare; The Jasmine and Bela are the two flowers from which the natives in this district chiefly produce the scented oil; the Chembal is another. Distillation is never made use of for this purpose, as it is with the roses; for extreme heat (from its being in the middle of the rains, when the trees come into flower) would most likely carry off all the scent. The Jasmine, or Chymbele, as it is called, is used very largely amongst the women, the hair of the head, and the body, being daily anointed with some of it.—Austic Journal.
Has the reader ever visited the belfry or the clockroom of a church tower? An hour may be spent in such a spot, if not merrily, at least pleasantly and profitably. There is food in such a place for contemplation of many different kinds. We are elevated far above the busy hum of street traffic, and can forget for a moment the world and its multitudes. We are in a room devoted to old Father Time, whose movements are measured by the work of men's hands, and whose hourly progress is recorded in tones which ring loudly through the church tower—progress which, however, Young doubts our power to value at its proper price:

"On all important Time, thro' every age,
Tho' much and warm the wise have urged, the man
Is yet unborn who duly weighs an hour."

We have beneath us a silent building whose purpose is of a solemn and sacred nature, and the invitation to which is sounded on the bells in the room where we are standing. The mournful tones which announce the consignment of a lifeless body to the grave, and the merry peal which lends its aid in times of rejoicing, alike emanate from the belfry. We may then turn our attention to the mechanism by which these effects are produced; and in proportion to our comprehension of the details, so will be our admiration of the skill displayed in the combined results.

Having recently paid such a visit as is here alluded to, we have thought that it might be made the theme of an article not wholly destitute of interest and of instruction. The philosophy of church clocks and bells
is a large subject; but it may be possible to give such an epitome of the mode of manufacture, the mode of action, and the mode of arranging these pieces of machinery, as to convey a few general notions on the matter.

In the first place, everybody knows that a church clock is generally fixed in the tower, or in some elevated part of the building; and it is also known that many churches exhibit clock-faces or dials in four different directions, so that the hour of the day may be observed by persons on all sides of the church. Now, we doubt not that many who may read this paper have entertained the opinion that in such a case there are four clocks, one for each dial or face, and who cannot conceive how all the four hands-those and the minute-hands can be moved by one clock. There are also, it is probable, many different opinions as to whether the bell or bells which strike the hour, which chime the quarters, which (in some churches) play a psalm or hymn tune at certain intervals, which are tolled at a funeral, and which are rung at times of rejoicing, are hung either over or under the clock, according to the size and general arrangement of the church tower; and that the hour is struck on a bell by a hammer moved by the clock; the quarters by similar mechanism acting on other bells; the psalm or hymn tune by the action of a rotating barrel similar to that seen in musical snuff-boxes; and the tolling and pealing by bell-ringers, who pull ropes connected with the bells.

There is in the eastern part of London a church clock which stands at a greater height from the ground than any other clock in or near the metropolis—not even excepting that noted city monitor St. Paul's which is eleved part of the building; and it is also known that the instrument which strikes on the bell, it may be stated that they are hung either over or under the clock, according to the size and general arrangement of the church tower; and that the hour is struck on a bell by a hammer moved by the clock; the quarters by similar mechanism acting on other bells; the psalm or hymn tune by the action of a rotating barrel similar to that seen in musical snuff-boxes; and the tolling and pealing by bell-ringers, who pull ropes connected with the bells.

Our frontispiece is so drawn as to show the general arrangement of the clock and its mechanism. The clock contains about thirty wheels, some of which govern the motion of the hands; others the striking of the bell. There are two barrels, from which weights are suspended by a cord, and the mode of winding up these is here represented, as well as the small dials for the guidance of the man who works the mechanism. The rods which act as a pendulum (but not the pendulum bob itself), together with other parts of the mechanism, are here seen, and will be understood better as the description proceeds.

The clock is placed in the centre of the room, and a visitor can walk entirely round it, without interfering in any way with the mechanism connected with the clock-faces visible outside the church. It may then be asked, how are the hands on these faces brought into connection with the moving machinery? We find an answer, by observing the arrangements overhead, as we pass round the clock. There is a horizontal bar of wood extending from the clock on each side to the wall opposite to it; and on this bar is placed an iron rod, the motion of which is set in motion by the striking mechanism, which causes the hands to rotate round the clock-face on the outside of the tower. There are four of these rods branching out from the clock in a horizontal position towards the four points of the compass, each rod governing the movement of one pair of hands. On looking downwards from the clock-room we see the mechanism by which these rods move the hands from the outside of the tower. This clock, which is that of St. Ann's church, Limehouse, is the one alluded to in a former paragraph; and we perhaps cannot do better than make the text for what we have to offer on this subject.

The value of a church tower is such that the approach to the bell-loft and clock-room is generally narrow and awkward to a degree which renders the ascent anything but inviting. The short, narrow, steep, dark, and winding stairs; the loopholes through which the wind finds entrance in a cutting blast; the small doors and outlets; the dreary loneliness and no less dreary echo of the footsteps; the cold and the dust—all are familiar to those who have ascended to the upper part of St. Paul's cathedral, and are almost equally observable in other church towers, including the one to which our attention is here directed.

On ascending to a height of about a hundred and thirty feet, in the tower of Limehouse church, we find ourselves in the 'clock-room.' This is a square room, bounded on the four sides by the thick walls of the tower, and having a wooden flooring on which the clock rests. The light is very limited, and it is not till the eye has become a little accustomed to the gloom that the objects in the room are discernible. The clock is seen to be enclosed in a wooden case, about eight feet high, six feet wide, and the two opposite sides of which may be thrown open by means of folding-doors, thus exhibiting a complicated assemblage of wheel-work and other mechanism within.

Thus far for the general arrangement; and now we may attend a little to the manufacture and mode of action of these several parts. Not the least remarkable of the circumstances connected with church clocks and bells, is the very narrow limits within which the manufacture is confined. There are, we believe, only two establishments in the metropolis at which church clocks are made, and only one church-bell foundry. The cause for this limitation may perhaps be sought in the comparatively small number and long duration of these pieces of mechanism. New churches shoot up by tens, and old ones do not have a renewal of clocks and bells except at long intervals. We have been favoured by the proprietors of one of these two clock-factories, and of the bell-foundry, with such details and facilities as may be necessary for our present purpose. Messrs. Moore and Co., at their clock-factory in Clerkenwell Close, have preserved a list of the church and bell-clocks made at their establishment during the last forty years; and a glance at this list shows how small is the number of these large clocks required, compared with clocks of smaller dimensions. Out of eleven or twelve thousand clocks made at this factory...
during the space of time here mentioned, between three and four hundred were church or turret clocks, and the remainder house and musical clocks; yet these three or four hundred have required mechanism and manufacturing arrangements so extensive, that we can easily see why the manufacture of church-clocks should be in few hands.

Neither a pocket-watch, nor an eight-day dial, nor a common church-clock, will exactly convey an idea of the construction of a church-clock; for, instead of being moved by a spring, as the two former, it is moved by a weight; while on the other hand its accurate finish of workmanship is wholly unrepresented in the Dutch clock. Generally speaking the frame-work of a church-clock is made of iron, the principal wheels of brass, and some of the pinions and finer work of steel. The arrangements of the maker are therefore regulated according to the number and parts of the clock made at his factory. Whoever has seen a watchmaker at work, must have observed the extreme minuteness of his tools and working apparatus; but such a person is not strictly a maker of watches; he only puts together and adjusts and repairs the various parts which have been made by different hands. He is essentially a manufacturer, and especially in church-clocks, this subdivision of employments is not carried out to nearly so great an extent. At Messrs. Moore's factory almost every part of the mechanism of a church-clock is made within the establishment, except the rough castings in iron and brass. In the smith's shop all the forging and filing of arbors, bars, and other works of iron, are effected; as well as the case-hardening of the finished pieces. In the wheel-cutting shop is carried on the beautiful operation by which the teeth of wheels—that important department of all such manufactures as this—are cut. In other shops the general fashioning and adjustment of the numerous pieces which form a clock and watch are variously worked, such as lathes for turning brass, iron, and wood, drills, revolving machinery, polishing apparatus, &c. Those who are accustomed to factories of this kind will easily understand the appearance and general arrangement of such a place; those who are not, must conceive thirty or forty men working on pieces of metal which require great skill and care in their preparation.

Without attending particularly to the classification which a clock-maker would lay down, we will separate a church-clock and its mechanism into five parts—1st, the moving-power; 2nd, the 'movement' or going-wheels; 3rd, the regulation, or pendulum arrangements; 4th, the indication, or mechanism connected with the hands; and 5th, the striking machinery. Any attempt to follow the minute details of clock-making would be quite out of the question, and will not be made here.

First, then, the **power**. Every child knows that the old familiar clock, which has perhaps formed one of the household inmates as far back as he can remember, is wound 'up' by means of a very small key; but there are many children of larger growth who are utterly at a loss to know what this 'winding-up' really means. The main body of a clock consists of many wheels which work one into another, insomuch that if one wheel moves, the others are drawn into motion by it. But there must be something to impart this motion in the first instance; and this is called the **power**. We know that if the pendulum of a common clock be stopped, the clock is stopped at the same moment; and that the movement of the clock is renewed when the oscillations of the pendulum are restored. Hence many persons may suppose that the pendulum is the source of the clock's motion. Again, there are stop-watches in which, by moving a little pin, the watch may be made to stop; and then, by a contrary movement, the going of the watch may be renewed; and hence the pin seems to be the source of motion. But both these suppositions are erroneous. In both these cases of stoppage, the rotating wheel-work is checked by a small piece of mechanism, and the motion is renewed when the check is removed; but the production of the motion is a totally different affair. In a common pocket-watch, the key by which the winding-up is effected is placed on a small piece of mechanism called a 'fusee,' from which a chain extends to a brass box or barrel. This barrel contains a fine and highly tempered steel spring, which becomes coiled up very tightly by the rotation of the fusee and the winding on of the chain from the barrel. This tight coil is so different from the natural state of the spring, that the latter exerts a powerful pulling force in its endeavours to regain its original position; and this force tends to make the barrel in which it is fixed rotate, because by this means only can the original state of the spring be regained. When the pin is turned it is moved in the opposite direction, by which the rotation can be communicated, by toothed wheels, to other mechanism. Such is the source of power in pocket-watches, in chronometers, and in the dials which are now so much used in public buildings and large apartments.

In church-clocks, turret-clocks, and common house-clocks, there is no such spring as that alluded to in the last paragraph. There is a line or rope, descending perpendicularly from a particular part of the wheel-work, and having an iron weight suspended from its lower extremity. The iron appendage of course exerts a gravitating force in proportion to its weight, and descends gradually; but from its mode of attachment, it cannot so without causing the rotation of a barrel round which the cord is wound. When the pendulum is stopped, either purposely or accidentally, a catch or detent falls into such a position as to prevent the rotation of the barrel; but this obstruction being removed, the barrel rotates so long as the weight descends; and this rotation is communicated, by toothed wheels, to the mechanism in the time-piece. The time-piece is made up of a number of mechanisms arranged in different directions, as well as in the upper floor, or when all the cord is unwound from the barrel, the clock must stop; but before this time arrives the machine is wound up by causing the barrel to rotate in an opposite direction, by which the cord becomes rewound upon it, and the weight elevated.

In a house-clock the weight is so small that the winding-up is effected easily by pulling a small handle; but in larger clocks the aid of a winch or windlass is required. The length of the cord is proportioned to the diameter of the barrel, and to the time which the clock is intended to 'go' between each two windings; and is, in a church-clock, very considerable. At the Limehouse clock, which was made two or three years ago, the going is, as in most church-clocks, eight days, and the weight by which the barrel is made to rotate amounts to about sixty pounds. The line does not fall perpendicularly from the clock to the weight, but passes over two or three pulleys for economy of space.

2nd. The 'movement,' or the going-train of wheels. The makers of clocks and watches apply the name of the 'movement' to the assemblage of wheels which are put in motion by the moving-power. Technically, those wheels which are connected immediately with the hands, with the pendulum, or with the striking machinery, are excluded from this group; but our purpose here is to say a few words respecting the wheel-work generally.

Almost every wheel in a clock has teeth or notches ...
cut in its circumference. Sometimes these teeth stand 
out radially from the edge; sometimes they are pe-
pendicular to the plane of the wheel; sometimes they 
nearly resemble the teeth of a saw; but whatever be 
the varieties, a glance at the interior of a clock or 
watch will show that almost every one has these in-
dentations in some form or other. This is one of the 
modes adopted in general mechanism, for communi-
cating motion from one wheel to another; pulleys, 
strips, and bands being inconsistent with the minute-
ness of a clock or watch. In some cases two adjoining 
wheels work into each other, the teeth of one inter-
locking in those of the other; but in other cases a 
small number of teeth are cut in the pinion or axis of 
one wheel, which work in the teeth at the circum-
ference of the other wheel; and indeed it is in this 
latter way that a difference of velocity is generally 
atained. If, for instance, a wheel with fifty teeth work 
into a pinion of ten teeth, the pinion will rotate five 
times as fast as the wheel, and thus becomes a source 
of higher velocity. The great point of attainment in 
the ‘movement’ of a clock or watch is, that one parti-
cular wheel shall rotate exactly once in an hour; this 
being effected, the arrangement of the hour and 
minute hands becomes easily determined. The pro-
portions of the teeth in all the wheels and pinions is 
therefore so fixed as to lead to this rate of movement. 
In the Limehouse clock the barrel, which is a solid 
cylindrical block of elm, about eighteen inches in di-
ameter, is attached at one end to a toothed wheel, about 
two feet in diameter, which rotates with it; and this 
rotating wheel forms one in a train which leads to the 
hourly rotation of one particular wheel.

The manufacture of the ‘movement’ or ‘going-

train’ of a clock or watch consists, therefore, princi-
pally in the careful preparation of toothed wheels and 
pinions. These wheels are made sometimes of brass, 
and in others of gun-metal, while the pinions are of 
case-hardened steel. With respect to the factory before 
mentioned, the wheels are brought thither in a very 
rough state, just as they are produced by the caster or 
founder, consisting merely of a circular rim, connected 
more or less with the central part through which the 
axis is to pass. The whole manufacture of the wheel 
from this rude germ is then effected in the shops of the 
factory. There are lathes for giving to the wheel a 
perfectly true periphery, by means of sharp steel tools; 
various pieces of mechanism for shaping, smoothing, 
and polishing every part of the surface; and, lastly, a 
very beautiful engine for cutting the teeth.

The cutting-engine is represented in the annexed 
cut. There is one part of the mechanism for cutting 
the teeth, and another for regulating their distance one 
from another. At Messrs. Moore’s factory there are 
two of these engines, one moved by a foot-treadle, and 
the other by a winch-handle, but the essential mecha-
nism is the same in both. A horizontal rod or bar is 
made to rotate on its axis with great rapidity; and at 
one part of its surface is fixed either a wheel or a 
small sharp piece of steel, corresponding in shape to 
the teeth about to be cut in the brass wheel. The 
barrel is fixed horizontally on a stand, at such a dis-
tance from the cutter that the latter can just reach it 
in the course of its rotation. The amazing rapidity 
with which the cutter rotates enables it to cut through 
the brass with great ease, the pressure or contact 
being regulated by a lever which the workman moves 
with his right hand. Cutters of various shapes and
sizes, but all made of hardened steel, are provided for the cutting of different kinds of teeth. When one tooth is cut, the workman shifts the wheel round a little, to present a new portion of the circumference to the action of the cutter; only one tooth being cut at a time.

The extent of this shifting is managed thus:—A brass plate, lying horizontally on the bed of the engine, is marked with a great number of concentric circles, each of which is divided into a number of precisely equal parts, the number being different in the different circles. One circle, for instance, is divided into forty-eight parts, another sixty-four, a third seventy-two, and so on, as may be found most advantageous.

If a wheel is to have any number—say sixty-four—teeth in its circumference, a lever is so adjusted that a sharp point in one of the parts of the sharp point attached to the end of the lever will drop into all these holes in succession, as the plate revolves. The rotation of the wheel which is to be cut causes also that of the divided plate, and the rotation of the sharp point into one of the little holes, when it has shifted round the wheel to a sufficient distance.

No one who has not closely attended to the matter can conceive the difficulty which has been experienced in thus dividing circles into any number of rigorously equal parts. All the resources of art shown by Ramsden and other instrument-makers, have been required in the division of circles for astronomical instruments; and although such strict accuracy is not required in common clock and watch-work, yet the amount of skill required and shown therein is sufficiently striking.

Whether the teeth be cut in brass, in gun-metal, in iron, or in steel, whether they are in the wheel itself or in the pinion, and whatever their shape may be, the cutting is effected nearly in the same way, and is succeeded by various finishing and polishing processes requisite for the accuracy of the wheel's motion. Here we may leave them and proceed to...

3rd, The indication, or mechanism connected with the hands. The dial-plate, or rather, face of a large church-clock, for example, is thirteen feet in diameter, with hands and figures of proportionate size. The hands are made of copper, and weigh about sixty pounds the pair. Each hand has, at the extremity opposite to the pointed end, a heavy piece of copper sufficient to act as a counterbalance, and to allow the hand to obey the motion of its axis; this counterbalance is generally painted black, to render it less visible. The arrangement of the mechanism connected with the hands may perhaps be understood from the following description.

It will be seen in the frontispiece that at the upper part of the clock a horizontal plate, or rod, extends from the tower to the lower end of it, and is attached a mass of cast-iron shaped like a double-convex lens, about thirty inches in diameter, and weighing two hundred pounds. This is suspended from the framework above, and acts in the following manner:—As the wheels revolve, one part of the mechanism gives an impulse to the pendulum, by which it is set in motion, and another urges the pendulum in the opposite direction, and thus the oscillations are produced. But as the pendulum, from the law which governs its movements, has a tendency to make all its oscillations in equal time, it acts as a regulator to the motion of the wheels, and gives it uniformity. As a ball, rolling down an inclined plane more and more rapidly every second, so would the rotation of the wheels in a clock increase in rapidity every second, were it not that the pendulum absorbs, as it were, all this increase of velocity by increasing its own extent of oscillation, leaving the time between every two oscillations unaltered. It is this equality of time in the movements of the pendulum which produces and maintains equality in the movements of the wheels.

The mechanism connected with the pendulum is not very extensive. The rod is a plain piece of wood, squared and smoothed for the purpose. The mass of iron, or 'bob,' is cast to the required shape and size, and has an adjusting arrangement by which it can be attached to the rod at any part of its height. In some church-clocks, as seen in our frontispiece, there is...
graduated arc to measure the extent of the vibrations, which varies with the moving-power. At the upper end of the pendulum are small pieces of mechanism, in iron and brass, by which the rod is brought under the influence of the wheel-work, and set into oscillation. The 'bob' of a church-clock pendulum, from the necessary length of the rod, is in most cases beneath the room in which the clock itself is contained.

5th. The striking machinery. Our clock has hitherto been a silent monitor. We have offered a few items of explanation as to the manner in which it shows to the eye the progress of time; but there is an appeal to the ear which is equally worthy of notice. Everyone knows that church clocks differ greatly in the number and frequency of the sounds emitted from the bells. Many clocks only strike the hour, proportioning the number of strokes to the hour of the day; others, in addition to this, announce the quarters, by two, four, eight, or some other number of bells, all bearing a certain musical relation one to another; and a third kind play some particular hymn or melody at certain intervals of time on eight or ten bells. But all church-clocks, with very rare exceptions indeed, have a bell on which the hour is struck.

It will easily be conceived that if a bell be hung in a particular spot, and a lever with a hammer at the end be placed near the bell, the lever may without difficulty be so influenced by the wheels of the clock as to cause the hammer to strike the bell. But to cause exactly an interval of an hour to elapse between two such strikings, and to make the number of blows on each occasion correspond with the hour of the day, require mechanism almost as complicated as that by which the indications of the hands are produced. Still greater is this complication when the clocks chime the quarters; and when a regular melody is performed on the bells, the arrangements are proportionally more intricate.

In the first place it must be clearly borne in mind that there is a separate moving-power for the striking-machinery, similar in principle to that which impels the going-train. In an eight-day dial, for example, there is one spring-barrel and fusee for the going-train, and another, nearly the same in form and size, for the striking-train. In a church-clock, and in common Dutch clocks, there is one iron weight for the going-train and another for the striking-train, each weight having a cord and barrel appropriated to itself. If we notice the movements of a common domestic pendulum clock, we shall see that while one of the two weights is continually descending, at a slow rate, the other descends only while the clock is striking; it is the descent of the last-named weight which causes the striking of the clock, and this striking would be continuous if there were not checks to the descent of the weight. For a large church-clock, where the tones of the bell could not be clearly elicited, except by blows from a heavy hammer, the moving-power of the striking machinery greatly exceeds that of the going-train. In the Limehouse clock the going weight is about sixty pounds, whereas the striking-weight is a mass of iron weighing five hundred pounds, and the hammer-head fifty-six pounds. This heavy mass is attached to a rope which winds round a solid wooden barrel, of nearly the same diameter as the barrel before spoken of, and this barrel gives motion to a train of wheels by the customary tooth and pinion work. The motion, however, is checked by a catch or detent, except at the termination of each hour, when a curious piece of mechanism connected with the going-train releases the striking machinery. The weight is then allowed to descend, and causes the hammer to strike the bell. Whether the bell be above, below, or at the side of the clock, the connection between the striking-wheels and the hammer is easily made by levers and pulleys; at the Limehouse clock the bell is beneath the other parts of the mechanism.

The mechanism in immediate connection with the hammer and bell of the Limehouse clock is shown in the annexed cut.

But although the release of the striking machinery causes the descent of the weight and the percussion of the bell, yet this does not determine whether the strokes shall be one or many. This is determined principally by two pieces of mechanism called a 'snail' and a 'rack,' the intricate action of which it would be vain in attempt to explain here. Suffice it to say, that the time during which the striking weight is allowed to descend, varies at different hours of the day; it being sometimes only long enough to permit one blow to be given by the hammer on the bell; and at another time long enough for twelve such blows.

When the clock indicates the quarter-hours on two or more bells, an additional piece of mechanism is necessary, which releases the hammer of those bells every fifteen minutes. If the bells are so numerous, and the mechanism so elaborate, as to produce a musical chime or a melody at stated intervals, then we have those well-known effects with which the poet and the peasant are equally familiar—effects which many have felt as well as Cowper, but which few can express so well:—

"How soft the music of those village bells,
Falling at intervals upon the ear
In cadence sweet! now dying all away,
Now pealing loud again and louder still,
Clear and sonorous as the gale comes on."

The merry peal which marks the holiday or the day of festivity is, as we have before observed, not rung by machinery connected with the church-clock, but by men, who pull ropes by which hammers are made to strike on a set of bells; each man attending to one bell, and the whole regulating their proceedings according to the rules of the curious art of bell-ringing. But where a melody is performed at fixed hours every day, then are the bells sounded by mechanism connected with the clock. He who hears the 149th Psalm played on the bells of St. Clement's church, or the other tunes on the bells of Cripplegate and Shoreditch churches, must not confound these performances with the ringing of a peal of bells.

In some churches, the bells play only one tune, at certain fixed hours of the day; in others, there are seven different tunes played, one for every day of the
Supplement.]

The Penny Magazine.

We have glanced over the main parts of the mechanism of a clock; but we cannot treat of the 'striking' machinery without describing the bells themselves, the vast sonorous masses for the sounding of which so much mechanism is required. This will take us from the clock-factory to the church-bell foundry, of which the only one in London is that of Messrs. Mears in Whitechapel.

All bells are made of a compound of copper and tin, and all are cast in moulds. A bell-foundry exhibits an earthen floor, excavated in parts to a depth of several feet, and having furnaces in which the metal is melted. At Messrs. Mears's foundry there is one furnace which will melt ten tons of metal at once, and another of smaller size. In this larger furnace was melted the metal for the 'Great Tom of Oxford.' The latter weighs seventeen thousand pounds, whereas the great bell of St. Paul's amounts only to between eleven and twelve thousand pounds. The new "Great Tom of Lincoln" (twelve thousand pounds) replaced, in the year 1835, the old bell of the same name, which was not so heavy by a ton. The thickness varies so greatly that the weight cannot be judged from their size. St. Paul's bell, for example, is much larger than the "Great Tom of Lincoln," but is not so heavy; but all the weights here indicated sink into insignificance when compared with that of some of the Russian bells, 30,000, 124,000, 144,000, 298,000, 432,000 lbs.; these largest bell in England except the "Great Tom of Oxford." (See 'The Penny Magazine,' No. 163.)

Both the shape of the bell and the proportions of the two metals are regulated so as to produce the most sonorous effects. There are about four parts of copper to one of tin. The tin is usually brought to the foundry in blocks from the mining districts, and the copper is prepared in smallersize. In this larger furnace was cast the great bell of St. Paul's, which was not so heavy by a ton. The thickness of the barrel, for example, is much larger than the "Great Tom of Lincoln," but is not so heavy; but all the weights here indicated sink into insignificance when compared with that of some of the Russian bells, 30,000, 124,000, 144,000, 298,000, 432,000 lbs.; these largest bell in England except the "Great Tom of Oxford." (See 'The Penny Magazine,' No. 163.)

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But where many tunes are played by one barrel, this primitive mode is inefficient. The principle, however, may be understood from it. The bells 'pricked' for several tunes by the modern machine are so connected with the mechanism of the clock as to shift a little when the tune is changed, so that the hammers may be acted on by a different set of pins from those in use during the performance of the former tune; indeed, this shifting of the barrel is the circumstance which changes the tune.

* Reid, 'Treatise on Clock and Watch Making.
invert them one over another, we may represent the bell-mould in its built-up form; but if the middle basin be removed, there will be a vacancy between the other two. The vacancy thus produced in the bell-mould is that into which the metal is poured, a hole being left at the top for that purpose, and two others for the escape of air as the metal enters.

All this is done in the casting-pit, which is then filled up with loam or earth to the top of the mould, the height of which is nearly equal to that of the orifice in the furnace. A shallow channel is cut in the loam from the furnace to the orifice of the mould; the earth which stops the hole in the furnace is cut away; and the melted metal, flowing from the furnace along the channel, fills the mould.

In some parts of Germany the casting of a bell is made a matter of much ceremony; the bell-founder inviting a large circle of friends to witness the scene, which commences with a prayer, and terminates with rejoicing. Schiller made this the subject of one of his finest ballads, the "Song of the Bell," many stanzas of which vividly portray the process of foundling. We may select two, as relating, the first to the appearance of the pit when the mould or moulds are earthed in, and the second to the melting of the metal:

"Fast immured within the earth,
Fix'd by fire the clay-mould stands;
This day the bell expects its birth,
Courage, comrades! ply your hands.
Comrades! ceaseless from your brow,
Ceaseless must the sweat-drop flow.
If by his work the master's known,
Yet Heauen must send the blessing down.

Billet of the fir-wood take,
Every billet dry and sound,
That flame, a gather'd flame awake,
And vault with fire the furnace round.
Quickly cast the copper in,
Quickly cast due weight of tin,
That the bell's tenacious food
Rightly flow in order'd mood."

In our concluding cut the casting-pit is represented with eight bell-moulds, for the casting of the same number of bells. We saw these bells cast a few days after the drawing was made, the pit having been filled with loam in the interim. It is a sight worth a visit to see the furnace full of liquid fiery white metal, the narrow jet pouring out at the orifice, the stream of liquid fire running along the channel, and the bubbling of the metal as it flows into the mould. If the bells be large, only one is cast at one time in the pit; but several smaller ones, varying from three or four hundredweights to twelve hundredweights each, as was the case in this instance, can be cast at once, a gutter being carried from the hole in the furnace to the mouth of each mould.

The bell is cast in a complete state, but it requires a little adjustment to regulate its tone. If a set of bells are to be made, having intervals of tones and semitones, the requisite adjustment is made by reducing the diameter at the edge when the tone is too low, and reducing the thickness at the part where the hammer strikes when the tone is too acute. This reduction is made by chipping away the metal with a sharp-pointed hammer.
DECAY OF THE OLD FORMS OF HOSPITALITY AND CHARITY.

We have given (in No. 633) some examples of the style of living which prevailed in times long past, and have pointed out the fundamental circumstances which regulated the ancient modes of expenditure, and rendered the economy of that age extremely simple. With the reign of Henry VII. commenced those changes which, by the end of the sixteenth century, had sapped the foundations of old manners and up-rooted the circumstances to which they owed their life and spirit. The advance of the country in political and social improvement had its influence not only on manners as a living form, but effected the greatest changes in the sources from which they derived their vital principle. England was swayed by princes whose sceptre was undisputed by any party, and the violent conflicts between the crown and the aristocracy which had once disturbed the realm were over. The influence of these political improvements was very apparent. The effect of social improvements, of the growth of trade and commerce, was equally signal and beneficial; and it is gratifying to notice how greatly the combined influence of these two causes contributed to extend the wealth, power, intelligence, and refinement of the country.

Let us consider for a moment the effect of one great transition silently wrought by the operation of foreign commerce and manufacturing industry. These gave the landowner the means of converting the whole value of his rents into money; these he might now expend in the gratification of his personal wants and tastes, instead of being compelled to share the raw produce of his estates among tenants and retainers. The train of useless followers was thinned, but the funds which had supported them directly in rude plenty, now maintained independent artisans, who derived their subsistence not from a single individual, but from an undistinguished mass of 'customers.' The effect of this change on manners is only to be compared in importance to the fact that it gave social rank and consequence to a class which had previously been treated with little consideration. The highest classes were scarcely less affected by the transition. The gratification of personal vanity in so many other ways than by maintaining a large retinue rendered it more difficult to keep within the bounds of prudence and economy; and when these were overstepped, a revolution of fortune might be as complete as the violent confiscations which wrenched away estates from motives of political vengeance in a more turbulent period.

The political circumstances of the country at the period when Henry VII. put an end to the wars of the Roses, and their altered character at the close of Elizabeth's reign, would alone account for important changes in the aspects of social life. But during this period changes of an economic character were also in operation. In one of Latimer's sermons, preached "in the shroudes at Paule's," in 1548, we have an account of the alteration which had taken place in the course of half a century, for the battle of Blackheath, to which
he alludes, was fought in 1477. It is a very interesting picture of rural economy at the close of the fifteenth century, as the following extract will show:—"My father (says Latimer) was a yeoman, and had no lands of his own, only he had a farm of three or four pound by year, at the uttermost, and hereupon he tilled much land as kept half a dozen men. He had walk for a hundred sheep, and my mother milked thirty kine. He was able, and did find the king a harness, with himself and his horse, while he came to the place that he should receive the king's wages. I can remember that I buckled his harness when he went to Blackheath field. He kept me to school, or else I was not able to pray before the king's majesty now. He married my sisters with five pound, or twenty nobles a piece. He kept hospitality for his poor neighbours; and some alms he gave to the poor, and all this did he of the said farm. Where he that now hath it payeth the sixteen pound by the year or more, and is not able to do anything for his prince nor for his children, or give a cup of drink to the poor."

The advance of rent in fifty years, from 4l. to 16l. or 400 per cent, is more apparent than real. The coin had been depreciated. In the reign of Henry VII. the pound of silver was coined into forty-five shillings, but when Latimer preached, the pound of silver was coined into forty-two shillings; and thus, as Mr. Jacob remarks: 'Conversion of the threepence into threepence of 1497 was worth 26s. 8d. of money of the present day, but the pound of 1548 was worth only 17s. 8d.; so that the real advance of rent was in reality from 5l. 6s. 8d. to 14l. 2s., or about 160 instead of 400 per cent. This advance, Mr. Jacob says, corresponds with the general advance of prices in all commodities. Still, the effect of such a rise, when it operated universally, had a very remarkable effect on the condition of the country. Some time would elapse before it was discovered that the advance of prices was not a temporary rise. This would be a season of great hardship for a large class; those who were buyers rather than sellers; those with fixed income, which could not be increased until leases, which were often for lives or for long periods, fell in. In the interval they would be struggling to uphold their dignity and station with diminished resources. This is a critical time for things which are not engrained upon necessity and utility; for either it sweeps them ruthlessly away, or they are maintained at an expense far beyond their real worth. But there was a larger class whom a period such as the one under contemplation irresistibly raises into increased importance. While consumers were driven to the practice of greater economy, the class of producers were stimulated to increased exertion; and though both classes might be inconvenienced at different stages of the transition, yet, when time had adjusted their respective interests, each would be placed in a better position than at the commencement of the change.

We know, from a tract published thirty years after Latimer preached his sermon at Paul's Cross, that the landowners complained of having been compelled to give up their bountiful mode of living, and 'to keep either a chamber in London, or to wait on the court uncleally, and a lackey after him, where he was wont to keep half a score clean men in his house, and twenty or twenty-four other persons besides, every day in the week.' Those who still kept their houses open in the country could not, they said, with 200l. a year, keep up the same style of living, which no farther than sixteen years before (1523) they could have kept on two hundred marks (133l. 6s. 8d.).

We thus see how necessarily and inevitably the forms of ancient hospitality underwent an alteration during the period of these changes; and they were not less influential in modifying the old charitable customs of the age. The custom of relieving the poor at the gate, so far from alleviating the evils of pauperism, raised it to a higher level. The extending field for industry absorbed a portion of the retainers, whose presence in great houses was now an incumbrance, and the dependants of the suppressed monasteries had the same resource before them: but previous habits of dependence had probably unfitted large numbers of these two classes for industrious pursuits; and at the close of Elizabeth's reign benevolence itself recoiled at the flood of pauperism which threatened to overwhelm the land; but it was not until whips and brands and other harsh and ignominious punishments had been in vain employed, that a more rational mode of treating the evil was adopted. With a compulsory law for relieving the poor, men closed tighter the purse-strings of private charity. Thus, at the close of the sixteenth century, hospitality and charity had adopted the forms under which they are exercised at the present day, though, to the writer of the 'Old and Young Courtier,' who lived perhaps half a century ago, the reign of Elizabeth, that reign might appear par excellence as the age of hospitality and charity; but the octogenarian of the year 1600 had witnessed a great decline in both.

The Restoration, that period of reaction, when the Puritanism of the Commonwealth was followed by a general spirit of extravagance and dissoluteness, was remarkable for the decline of old fashion, which were laughed out of use or silently neglected. The most immediate effect of this change would be perceived in the young heirs and their imitators, to whom the increased facilities of converting their produce, or even their estates, into money, gave the means of swarming among a court and a luxurious life, and their health in the dissolute pleasures of the metropolis. In Ben Jonson's 'The Devil is an Ass,' written early in the reign of James I., a young gallant is thus addressed:—

"This comes of wearing
Scarlet, gold-lace, and net-work! your fine garterings,
With your blown roses, cousin! and your eating
In velvet."

In another piece, of about the same period, 'The Staple of News,' he introduces a young heir arrived in London, and impatiently awaiting for his 'fashioner.'

"There, drop my wardship; My pupillage and vassalage together; And liberty, come throw myself about me, In a rich snuff, cloak, hat, and band, for now I'll sue out no man's livery, but mine own; I stand on no man's feet, so much a year, Right round and sound, the lord of mine own ground, And (to rhyme to it) three score thousand pound."

Such were too often the characters of the king's young courtiers, and our artist, Mr. Buss, has vividly depicted a step in their career. Fortunately these were only accidental evils belonging to a change in so many other respects advantageous.

MODERN BRIGANDS.

(Continued from page 119.)

In 1806 the French again took the road to Naples, and the Bourbon and his court fled again to Sicily. The government now established was not a republic, but a most absolute monarchy, with Napoleon's brother, Joseph Bonaparte, for king. Then there arose fresh insurrections in Calabria, in Apulia, and nearly all parts of the unhappy kingdom. The French called all the brigands, and treated them as such whenever and wherever they could catch them; but in truth many of these
men were either honest enthusiasts for their old king, or were driven to arms by the oppression and insolence of the French soldiery. "You are the thieves," said a Calabrian prisoner to the French military tribunal established at Monte Leone: "for what business have you in our country and with us? I carried my rifle and my knife for King Ferdinand, whom may God restore! but I am no robber." As in the time of Cardinal Ruffo, many regular brigands did, however, take the field, not only in Calabria, where the French were subduing with extreme difficulty and immense losses, but also in the Roman frontiers and in the infamous districts of the Abruzzi, Basilicata, and Principato. Frà Diavolo was foremost among these, and being joined by robbers from both sides of the frontier, from the Roman states as well as from the kingdom, he inflicted in the course of a few months an incalculable amount of mischief on the French, frustrating all their attempts to surprise and seize him. In Apulia, three brothers of the name of Vardarelli, who had been robbers on a smaller scale before, collected a very numerous band, and maintained themselves for twelve years, until Bonaparte and all the dynasties he had established had been swept away. One of the chief scenes of their exploits was the valley of the bridge of Bovino, where extraordinary things passed. The only road from Naples to the plains of Apulia, the provinces of Bari, Lecce, Otranto, &c. They seldom, if ever, descended to attack common travellers; but they plundered the government procaccie or mails, the French officers, employés, and revenue collectors, and they lived at large upon the farmers and agents of the military, not seldom were seen and proclaimed, who were compelled to furnish them with meat and drink, and forage for their horses, being besides occasionally compelled to pay a sort of black-mail in hard cash. Their numbers were never precisely known, but it is supposed that the Vardarelli band was at times two hundred strong. They were for the most part well armed and accoutred, and excellently mounted. Under other circumstances, Don Gaetano, as the eldest of the three brothers was called by courtesy, might have become a great general. He maintained the strictest discipline among his lawless troops; he was active and acute to a marvellous degree; his strategy foiled the best officer that was sent against him; he was never surprised himself; and the French generals, who were penniless and penniless in the valley of Bovino and Apulia, he struck numerous occasions on which he had fooled them. As he approached the capital, thousands flocked out to see him, there, and everywhere almost at the same moment, he was foully betrayed by some of his own brigands, and marched off in the midst of a regiment of French regulars. As he was always passed for honest men, and to escape across the narrow Strait of Messina into Sicily, carrying with him, as was said, a considerable treasure. Parafante, who collected part of Franca-tripa's scattered band and united it to his own, was still more troublesome to the French, who were unable to destroy or take him. It appears doubtful whether Scarolla was a real brigand or a partisan. Queen Carolina, from Sicily, had supplied him with arms, uniforms, and money; and many of the Calabrians and the mountaineers from Basilicata, who rallied round the Bourbon standard he hoisted, had not yet had time to repel the French moveable column, employed on altogether different business, stumbled upon them by mere chance as they were lying asleep on the ground. The greater part of them were shot or bayoneted upon the spot; and the remainder fled in all directions. The French soldiers obtained so considerable a booty, that it is said Parafante's band was worth a pitch and a half a million dollars and gold doubloons. Scarolla himself did not fall; but he was so severely wounded as to be obliged to take refuge with some shepherds, who, for the promised reward of a thousand ducats, gave him up to the French. He was hanged shortly after. Frà Diavolo had finished his career some time before this. After hairbreadth escapes, he landed in Siracusa, after setting both civil and military authorities at defiance, after having long impressed the people with the notion that he was invulnerable and must be ubiquitous, for he seemed to be here, there, and everywhere almost at the same moment, he was foully betrayed by some of his own brigands, and marched off in the midst of a regiment of French regulars. Though covered with uncured wounds, though exhausted by the fatigue of a long and rapid march, with certain death staring him in the face at the end of it, he did not lose heart and courage; he taunted the French with the recollection of the mischief he had done them, and of the numerous occasions on which he had fooled them. As he approached the capital, thousands flocked out to see him. King Joseph himself was curious to behold the man who had for so many months filled the kingdom with his renown; and he rather unfeelingly ordered that he should be brought out to him at Portici. Frà Diavolo was accordingly made to turn back on the road to that royal dwelling. He was pronounced under a balcony of the palace, whence Joseph satisfied his curiosity, and then ordered him to prison and to execution. To the Special Tribunal, which went into no trial beyond proving his identity, he pleaded the colonel's commission he held, or said he held, from King Ferdinand; but no attention was paid to this plea, and he was presently beheaded in the open square outside the Capua gates.

To this day his name is seldom pronounced by the common people of Naples without a feeling of awe and terror."

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"MarFarlane, 'Lives of Banditti and Robbers.' Vincenzo C.co. 'History of the Neapolitan Revolution of 1799.' General Colletta, 'History of the Kingdom of Naples from 1713 to 1831.' " Letters on Calabria," by a French Officer."

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In former Numbers (410 and 422) we have given very ample accounts of the discovery of New Zealand and the early intercourse of Europeans with that country, the progress of its subsequent settlement, and the advantages which it presented as a field of colonization. Since those accounts were written (in 1838) New Zealand has become a part of the British empire, and the scattered settlements which had been formed without any legal sanction have become subject to the laws of England; new colonies of Englishmen have been planted, and very extensive plans have been adopted for maintaining a constant influx of labour and capital from the United Kingdom. A bishop of New Zealand has been appointed, though the creation of the see was not directly made by the government. In February, 1840, a newspaper, called the 'New Zealand Journal,' was established in London, and has since been regularly published every alternate week, for the purpose of supplying information respecting the progress of the new settlements to a large class in England who are earnestly interested in their success, and who have formed local associations in various parts of the kingdom to extend the interests of New Zealand colonization. Several newspapers are already published in the northern island. Thus, within the last four years New Zealand has become the scene of very important events, and perhaps the foundation of a new Anglo-Australasian empire has been laid whose future career cannot be contemplated without feelings of the deepest interest.

For the last forty years or more New Zealand had been resorted to by many Europeans and by colonists from New South Wales and Van Diemen's Land. They established whaling-stations along different parts of the coast, or settled in situations where supplies of flax and timber could be procured, their numbers being increased by runaway seamen and convicts, who, to escape detection, often joined some of the native tribes. At length this isolated foreign population amounted to a larger number than could safely be left without the restraints of law; and in 1825 an association formed in London urged the government to undertake the colonization of the country; but this object was not at that time accomplished. A few years afterwards the British government acknowledged the independence of the New Zealanders; a flag was presented to them in token of their sovereignty, and a resident official agent was accredited, though his powers did not extend to the enforcement of any re-
The evils of irregular settlement by persons frequently of lawless and abandoned character were not diminished by this step. In 1839 the Association of 1825 was revived, and through its exertions a very general interest was excited on the subject of New Zealand colonization. After much opposition the Association received a charter of incorporation as the New Zealand Land Company, but the government declined to take any steps in furtherance of the settlement of the country. Undeterred by the absence of official sanction, a large body of emigrants left England for the purpose of forming a colony under the auspices of the New Zealand Company, and in February, 1840, they arrived at their destination. By the end of November, 1841, the total number of emigrants who had left the United Kingdom for New Zealand regularly was 6,352; and by this time three colonies had been planted, the oldest being that of Wellington, at Port Nicholson, in Cook's Straits; New Plymouth, on the western side of the northern island; and Nelson, the site of which is not yet known in this country.

The systematic spirit in which emigration was now likely to flow towards New Zealand decided the government to meet them in payment of the sums specified as "land sharks," who had purchased thousands of acres from the natives, for a few articles of trifling value, were thus disappointed of their expected harvest, and the rights of the natives will in future be adequately protected. In the three settlements formed by the New Zealand Company reserves of land have been made for the native population. This just and humane treatment will probably be the means of a very great improvement on the wanton spirit in which the claims of the aboriginal inhabitants of other colonies were usually disregarded.

There does not appear to be the smallest reason to doubt that the transference of the sovereignty of New Zealand to a civilized people will prove beneficial to the natives. The population states that the natives have the same feeling of property as the English, and the possession of goods is considered as a sign of respectability and comfort. They are generally well dressed in apparel of British manufacture, and the blanket, which was once occupied in listlessness and sloth, or in savage warfare, is now devoted to the acquisition of things which conduce to comfort, and are calculated to imbue them with the tastes of civilized life. Mr. Jameson says that the native women often "acquire over the native and the English language. Mr. Jameson states that the natives are as bold and skilful as Europeans, and have, without any assistance, erected houses on shore. The example of the most respectable colonists, whom the natives see engaged in various kinds of labour, has induced the chiefs to apply themselves to occupations which they formerly disdained. It must not be understood that habits of continuous labour have been acquired, to the extent which is common in England; neither is this essential to their advancement; nor, if it were, could it be expected. Two centuries ago, or rather more, the English were far from being distinguished for their orderly and industrious habits. Farming and gardening appear to be the occupations in which they are most engaged. The example of the most respectable colonists, whom the natives see engaged in various kinds of labour, has induced the chiefs to apply themselves to occupations which they formerly disdained. It must not be understood that habits of continuous labour have been acquired, to the extent which is common in England; nor, if it were, could it be expected. Two centuries ago, or rather more, the English were far from being distinguished for their orderly and industrious habits.

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employed as pedlers, taking goods for barter in the interior; and they are said to be very fond of dealing and trading, and to be excellent bargainers. A people with these various qualities cannot sink to a low state of existence in the midst of a society which is eager to render their services of mutual advantage, and where public guarantees are given for their protection and improvement.

**AMERICAN SAW-MILLS.**

From a Correspondent.

In all new countries abounding with forests, as is the case in most parts of the continent of North America, saw-mills are almost as necessary to the well-being of every little settlement as mills for grinding corn. It is true that the axe in the hands of an American accustomed to living in the woods is often used in place of the saw; for where timber is of so little value, it is customary, where a small quantity of planking or scuttling is required, to hew the timber into the proper shape.

When the woods are surveyed and marked out into allotments of the customary extent, wherever there are streams of sufficient size to put in motion the machinery of grist or saw mills, and convenient sites for such buildings, the places are noted in the field-book kept by the surveyor, and the owner of the lands consigns the timber to be cut to the surveyor, who consequently puts a higher price upon them. Something of course depends upon the nature of the country in respect, for where mill-sites abound, the value of the lots of land containing them is not so much enhanced as where they are scarce. It very commonly happens that the beavers have, by constructing their dwellings and other buildings in the situation of two or three mill sites, and consequently found many of the saw-mills and grist-mills sonsuperintending them mill will find time to remove the sawing up of a good piece of timber. The saw, which is a stout plate, eight or nine feet long, is fixed in a strong frame in a perpendicular position, working with an up-and-down stroke, like the piston of a steam-engine; while at each stroke of the saw the platform upon which the tree is placed moves forwards the saw the requisite distance for the log to be acted upon. When the log has been placed upon the frame, one end of it is brought close up to the saw and adjusted for the purpose of taking off an outside slab, being held steadily in its place by an iron clamp. The machinery is then put in motion, and when the saw has performed its work to within an inch or two of the end of the log, it is stopped, the platform run back again by reversing the action of the machinery (which is exceedingly simple), and a thin wedge is inserted, which completes the work by separating the slab from the log. The saw is then applied to cut off a slab from the opposite side of the log, and when this has been effected, two out of the four sides have been ‘slabbed’ or squared. The log is then turned upon one of its other faces, where two more operations consist in the squaring of the original round piece of timber. The slabs are commonly thrown to one side as worthless.

While the operation of slabbing is over, the stick, as it is customary to call it, is gauged, and marked out by a chalked line into the proper number of divisions. If the stick is intended for thin boards, or for planks one or two or three inches in thickness, then the number of saws will determine the value of the lot of land containing them. If the stick is intended for square or oblong shaped joists or scantlings, it is then turned over, and marked out upon another face of the square, being still held together at one extremity in consequence of not allowing the saw to quite complete its work.

While a log is being sawed up in this way, the person superintending the mill will find time to remove the boards out of the way which the log previously operated upon may have yielded; but it is absolutely necessary that he neglect not to stop the machinery a little before the saw has completed each course, as is already explained; otherwise it might get spoiled by coming in contact with the iron clamp which is used to steady the log in its position. Since most of these saw-mills are built in lonely situations—at least so while the country remains unsettled, or is but partially taken up—it is but an irksome business for those who have to attend them night and day; and, during the dry seasons (when the streams are low) or in winter, owing to a considerable degree of cold. As some of the mills are destitute of roofs, and those which are roofed being, for the most part, open on both sides, for the convenience of rolling in the logs and removing the boards after the logs have been cut up, there is but little shelter from the storm, particularly when accompanied by a high wind. The profits, however, of a saw-mill are commonly such as to enable the owner, when he cannot make it convenient to attend it himself, to pay liberal wages to those who undertake to do it for him. The wages are, however, not paid in cash, but generally in a portion of the boards, planks, &c. produced, the labourer being left to dispose of them in the way he is best able; but since every settler in a new country requires timber in larger or smaller quantities, there is a constant demand for the produce of the saw-mill.

The saw-mills hitherto described are of the rudest and commonest character. Where lumbering is carried on to a considerable extent, some of the mills will have two or three saws in operation at the same time; and there is also the labour of cutting down the trees, cutting them into convenient lengths for being hauled to the saw-mill by oxen, and then the hauling itself, which is done by a high wind. The saw-mills in America have extended their machinery...
Among the exceptions, however, there is one, which was erected more than twenty years ago, peculiarly deserving of notice; for it is doubtful whether there is a saw-mill to be compared to the one in question. This establishment was sufficient to supply a good-sized vessel with a cargo of sawed lumber, some idea may be formed of the capabilities of the Montmorency saw-mills.

The river Montmorency is a stream of considerable size, being one of the largest tributaries of the St. Lawrence. After traversing an uninhabited country for a distance of two or three hundred miles, it enters the St. Lawrence ten miles below the city of Quebec. Immediately, or very nearly, at its confluence with the latter river, its waters are precipitated over a huge barrier of rock from a height of two hundred and eighty feet, no other cataract within the limits of the British North American colonies, and the extensive territories of the United States included, being equal to the Fall of Montmorency in respect to the perpendicular descent of the fall. The channel of the St. Lawrence is divided into two parts by an island immediately opposite to where this tributary stream enters it, the southern one being generally frequented by vessels passing up and down that river, so that this stupendous waterfall is not visible to many sea-going vessels. The northern channel is, however, of sufficient capacity for ships trading to Quebec; which, probably, influences the selection of vessels of those that pass near the mouth of the Montmorency river. This large saw-mill, or saw-mills, as the extensive range of buildings commonly called, besides containing several complete gangs of saws, also contained circular and other saws. The machinery connected with the entire establishment was propelled by a water-wheel of very moderate dimensions, but the force of the water that enabled it in motion was almost irresistible. This water was brought in a race or channel, which was lined with stout planking, from some distance above the head of the great waterfall; and for a considerable portion of this distance, and before it reached the works, situated on the very margin of the St. Lawrence river, the bank was so steep where the race had been dug, that there was more than one foot fall in every yard; while the planking of the race being smooth, and there being nothing to impede the torrent in its rapid descent, probably those who were unacquainted with the laws that regulate moving bodies on inclined planes may be able to form some idea of the force with which it was then thrown upon the wheel.

The race itself was considered by many a great though useless undertaking; but it was found completely to answer the purpose. To give constant employment to a mill of such powers as this possessed, necessarily required a very large supply of timber; but the neighbourhood yielding little or none, all that was brought had to be floated down from the country connected with the streams falling into the upper part of the St. Lawrence. In order to secure these rafts when they reached their destination, a large basin or dock was formed in the river fronting the mill, sufficiently capacious to contain some thousands of large trees; and from the gently inclined plane from the interior of the mill to the margin of this basin, as the place of the plug was in the saws wanted in the mill, a chain was carried out and 'hitched' round one end of the tree, when, in the short space of one minute, it would be hauled out of the water to the exact position it was intended it should be placed in preparatory to its being acted upon by the saws. The machinery for the performance of every part of the work connected with this establishment was so complete, that a comparatively small number of persons were required for superintending the different departments.

In constructing the piers by which the reservoir for containing the unsawed timber was inclosed, one of them was made to answer the purpose of a quay or wharf for ships to lay along-side of while taking in their loading; and when it is stated that a single day's full employment of the various saws and machinery of this establishment was sufficient to supply a good-sized vessel with a cargo of sawed lumber, some idea may be formed of the capabilities of the Montmorency saw-mills.

ORNAMENTAL WOODS USED IN THE ARTS.

It is familiarly known to most persons, though few have devoted much thought upon the matter, that however general may have been the custom of painting articles formed of common wood, as a means of beautifying, there have for many centuries been some kinds of wood more esteemed for the beauty of their natural appearance than for any pigment which could be laid upon them. Among the numerous kinds of costly wood enumerated as having been employed in the building of Solomon's Temple, it seems more than probable that many of them were selected for the beauty of their appearance, and were left uncovered.

If we analyse the motives which lead us to prefer one kind of ornamental wood to another, or to draw comparisons between them, we shall find that lustre, figures, and colour are required, according to the disposition is directed; and it is interesting to trace the causes which produce variations in these qualities. This was done a few years ago, in an instructive manner, by Mr. Aikin, in one of his illustrated lectures before the Society of Arts. We shall condense the chief details of his elucidation.

The first cause of difference in different woods is the nature of the fibre. The fibrous portion of wood, when examined with a glass of moderate power, appears to consist of bundles of fine filaments, more or less parallel one to another. These filaments are more or less translucent, when held between the eye and a bright light, and have a smooth polished surface; a structure which produces a beautiful play or light, according to the angle under which the fibres are viewed, the degree of light, or the lustre, depending on the number of adjacent fibres that have their reflecting surfaces strictly parallel. When the fibres proceed nearly in right lines, their lustre is very different from that displayed by tortuous fibres. In some kinds of wood, such as fir, and still more in oak, ash and mahogany, the bundles of fibres meet with obstructions which throw them into gently waving or tortuous directions. The parallelism thus becomes disturbed more or less in some parts, while it is uninfluenced in others; and thus result some of those beautiful variations of lustre which the same piece of wood presents. In the horse-chestnut and in the box the fibres are not sufficiently parallel to produce great play of lustre on the surface, although individually they have considerable brightness.

The next source of variety is afforded by those thin plane portions of the woody structure which vegetable physiologists term the medullary plates. The structure of these plates is invisible to the naked eye; but when viewed through a magnifying-glass it appears to be composed of fine granular matter, which a powerful microscope further resolves into a cellular structure. This substance is in general dull and incapable of receiving a polish, but it often gives great beauty to the fibres which pass over and between the medullary plates, by forcing them to assume a perfectly regular and parallel arrangement. "In the oak," says Mr. Aikin, "the medullary plates are much larger than in any other wood that I have seen; and when their broad side is brought to the surface by a section a little oblique to the direction or run of the plates, they have this peculiarity, that they are dull
Lastly, the general colour may be noted—of mahogany and rosewood we need say nothing, they are so well known—king-wood and zebra-wood, both from Brazil, are generally of rich yellowish brown, more or less varied by other tints; guica, crocus-wood, snake-wood, and sandal-wood, are among those which partake more or less of a brown colour. Satin-wood, brought from India and the West Indies, and fuscia, are two varieties of richly yellowish brown which is the prevailing colour. The can-wood, the barr-wood, the red sanders, the tulip-wood, the beef-wood, are among the foreign varieties of reddish-coloured woods. The varieties of British wood, kept unpainted on account of their beauty of appearance, are not great in number; the yew, the elm, the pollard-oak, and the walnut, are perhaps the principal.

Shrimps.—The office of shrimps seems to be that analogous to some of the insects on land, whose task it is to clear away the remains of dead animal matter after the beasts and birds of prey have been satisfied. If a dead small bird or frog be placed where ants can have access to it, those insects will speedily reduce the body to a closely-cleaved skeleton. The shrimp also acts in like manner, all traces of the flesh from the bones of any dead animal exposed to their ravages. They are, in short, the principal scavengers of the ocean; and, notwithstanding their office, they are deservedly and highly prized as nutritious and delicious food.
WARD WITH DISTINGUISHED SUCCESS. He possessed many advantages for the task. He was a warrior who held a distinguished position, the governorship of Calais for instance; he lived while the sentiments and language, and, to a certain extent, the influences of chivalry, were yet existing; lastly, he had all the benefit that a prolonged residence in the neighbourhood of many of the scenes described could afford him.

Of his style the 'Edinburgh Review' observes, that it is the "pure and nervous English of that early period."

Turning from the translation to the original, we may observe that Froissart's work may be divided into two parts or periods, the first comprising the events from 1326 (when the Chronicles begin) to 1356, for the materials of which Froissart was indebted to the writings of Jean le Bel, a canon of Liege, a confident of John of Hainault, whom we shall presently meet with in the field of Cressy; and the second, from 1356 to the death of Richard II. of England, in 1400; the materials for this period being collected personally by Froissart from the mouths of the actors in them, or still more directly by his being himself a spectator of what he had to describe. The last-mentioned period is of course more valuable not only as being more trustworthy, but as giving the author a better opportunity of infusing into his writings more of the qualities which give them such a charm; and from it, therefore, will the greater part of our pictures from Froissart be derived.

Froissart devotes a large amount of space to the English wars in France; and it is only necessary to mention the names of Cressy, Poictiers, Calais, to see...
how justly. As these three subjects will be included in our series, a very brief notice of the origin of the wars may be acceptable. The Conquest, in its results, made no change in the Norman kingdom, but gave it a crown, rather than England to the French duchy; and the marriage of Henry II. to Eleanor, the repudiated wife of Louis VII. of France, added the large territory known under the name of Aquitaine. The possession of so much was sure to lead to the desire for more, although, until circumstances seemed to hold out a kind of plausible excuse for the entire conquest of France, and a fair opportunity for achieving it, we hear little of such extravagant claims. Normandy was given up by King John, after the murder of Prince Arthur, almost without a struggle, and soon became amalgamated with the French kingdom. This loss would furnish one strong motive with subsequent English monarchs to conquer France; and another was given by the continual revolts breaking out in Aquitaine, and which were fomented by the French kings, anxious, naturally enough, to annex that country to their own, of which, indeed, Nature had marked it out as a part by its geographical position, and over which it must be remembered they possessed the nominal rights of suzerainty. The origin of the events here related is an idea for our purpose of the state of things when Edward III. laid claim to the French throne. The ostensible ground of that claim was descent from the French king, Philip the Fair, a son of Philip the Bold. Philip the Fair had three sons, who reigned successively without leaving any heirs male, and a daughter Isabel, who married Edward I. of England. At the battle of Poitiers Edward II. was born, and thus the claim to the birth to the claimant Edward III. But the operation of the same Salic law that caused the three brothers to follow each other, instead of allowing the first to be succeeded by his daughter, of course barred the claim of Isabel, and of Edward through her. The throne, therefore, reverted to a brother of Philip the Bold, who was dead, or his descendants, one of whom was living, and was acknowledged king, namely, Philip le Valois.

As if to make the claim still more indefensible, Edward had already done homage to Philip as king for his duchy of Aquitaine. It was in the prosecution of this claim that all those great battles which English valour and skill have made for ever memorable were fought; these will be fully related.

The English army, after ravaging and plundering through Normandy, had advanced near to Paris, as if to threaten the capital; when suddenly it turned, and resolved on the direction of Ponthieu, which, as well as Aquitaine, now belonged to the English king. He was followed by an immense army, commanded by Philip le Valois himself. The English in their route had to cross the river Somme, a difficult matter, as the bridges were all cut down, with two or three exceptions only, and these, with the fords, were strongly guarded.

At the ford of Blanchtache, however, after a spirited battle, they forced their way, just in time to avoid an attack by Philip at the head of his overwhemning forces. The French king, however, soon found that it was the position, and not the attack, that was to give the winning blow; and whether it was midnight the English king lay in the fields with his host, and "made a supper to all his chief lords of his host, and made them good cheer. And when they were all departed to take their rest, then the king entered into his oratory, and kneeled down before the altar, praying God devoutly that if he fought the next day, that he might achieve the victory; and then, when he had had his repast, he went forth till they came within shot, then they shot fiercely with their crossbows. Then the English king, omitting their other arrows, said, "The Englishmen, who were in three battles, lying on the ground to rest them, as soon as they saw the Frenchmen approach, they rose upon their feet, fair and easily, without any haste, and ordered their battalions, the first, which was the prince's battle; the archers and crossbowmen of the same side, where stood and supported the archers in the bottom of the battle. The Earl of Northampton and the Earl of Arundel, with the second battle, were on a wing in good order, ready to comfort the prince's battle, if need were. The lords and knights of France came not to the assembly together in good order; for some came before, and some came after, in such haste and evil order that one of them did trouble another. When the French king saw the Englishmen, his blood changed; and (he) said to his marshals, 'Make the Genoese go on before, and begin the battle in the name of God and St. Denis.' There were of the Genoese crossbows about a fifteen thousand; but they were so weary of going a foot that day for the league, armed with their crossbows, that they said to their constables, 'We cannot walk this day, for we be not in the case to do any great deed of arms, as we have more need of rest.' These words came to the Earl of A llençon, who said, 'A man is well at ease to be charged with such a sort of rascals, to be faint and fall now at most need.' Also at the same season there fell a great rain and eclipse, with a terrible thunder; and after the rain there came flying over both battles a great number of crows, for fear of the tempest coming. Then anon the air began to wax clear, and the sun to shine fair and bright, the which was right in the Frenchmen's eyes and on the Englishmen's backs. When the Genoese were assembled together, and began to approach, they made a great shouting and cry to do battle; but the Englishmen were still, and stirred not for all that. Then the Genoese again the second time made another leap, and fell cry, and stept forward a little, and the Englishmen removed not one foot; thirdly, again they leapt and cried, and went forth till they came within shot, then they shot fiercely with their crossbows. Then the English king, omitting their other arrows, said, 'Slay these rascals; for they shall lett
(...and trouble us without reason). Then ye should have seen the men-of-arms dash in among them, and killed a great number of them; and ever still the Englishmen shot whereas they saw thickest press: the sharp arrows ran into the men-of-arms, and into their horses, and many fell, horse and men, among the Genoese; and when they were down, they could not reyne again, the press was so thick that one overthrew another. And also among the Englishmen there were certain rascals that went on foot, with great knives, and they went in among the men-of-arms, and slew and murdered many as they lay on the ground, before to accomplish his desire, and so they went on proceedings in the endeavour to conquer France.

The recorded results of the battle would seem exaggerations but that they are so well authenticated. Besides the king of Bohemia, there perished the Duke of Lorraine, the Earl of Alençon, whose overweening pride and impetuosity had so much contributed to the fatal result, the Count of Flanders, eight other counts, two archbishops, several other noblemen, and it is said twelve hundred knights and thirty thousand common persons. Such was the cost to humanity of one day's proceedings in the endeavour to conquer France.

An Auberge in France.—Arriving wet and weary, to stand in the middle of a great brick-floored room, in which there has been no fire all the winter, in expectation of seeing damped flag burn; and finding, when they do, that the door into the corridor must be left wide open, that the draught may conduct towards the chimney the smoke, and the steam of wet clothes and damp sheets which must be dried there, as the economical kitchen exhibits only a few flames, and there are no fires to spare. The good old woman, to be sure, offered a remedy, as she said that we might, if we liked, take a dry pair of sheets, which had been slept in only once, and recommended hanging the dripping habit and cloaks in the green, or mossed windows let in full as much rain as wind. Add to my previous enumeration a dinner of dry bouilli and greasy cabbage, a faggot for our feet serving as a rug, and dirty alcove, with plenty of cobwebs, but no curtains.—A Ride on Horseback, &c., by a Lady.

Holland as it Was and as it Is.—Holland is the land of the chivalry of the middle classes. Here they may say, in honest pride, to the hereditary lords and nobles of the earth in the other countries of Europe, see what we grocers, fishcurers, and shipowners have done in your little West India Company, and are so proud of it. But, alas! this glory is faded. In the deserted streets of Delft and Leyden and Haarlem, the grass is growing through the seams of the brick pavements; the ragged petticoat flutters in the wind out of the drawing-room casements of a palace, the echo of wooden shoes clattering through empty saloons tells of past magnificence, of actual indigence. This has been a land of warlike deed, of high and independent feeling; the home of patriots, of heroes, of scholars, of philosophers, of men of science, of artists, of the persecuted for religious or political opinions from every country, and of the generous men who supported them. —Why is the Holland of our times no longer that Holland of the sixteenth and seventeenth centuries? Why are her streets silent, her canals green with undisturbed slime?—The greatness of Holland was founded upon commercial prosperity and capital, not upon productive industry. Her capital and industry were not employed in producing what ministers to human wants and gratifications; but in transmitting what other countries produced, or manufactured, from one country to another. She was their broker. The first result of the Union was not the more beneficially to productive industry, had grown large enough to enter also into the business of circulation, as well as into that of production—into commerce, properly so called—the prosperity of Holland, founded upon commerce alone, unsupported basis of productive industry within herself, and among the mass of her own population, fell to the ground. This is the history of Holland. It speaks an important lesson to nations.

Laing's Notes of a Traveller.)
More than half of the population were settled in the town of Singapore, which contained 16,148 individuals, of whom there were 12,748 males and 3,400 females. It is very probable that the population of the settlement now (1841) amounts to more than 36,000 individuals, which gives more than one hundred and thirty persons to a square mile, which is a considerable population even in a country that has been settled for centuries, and is certainly a very surprising population in a country which twenty years ago was a desert.

The population is of a very mixed character; the following classes are enumerated in the census of 1836:
- Europeans, nearly all Britons; Indo-Britons; native Christians, mostly Portuguese; Americans, Jews, Arabs, Malays, Chinese, natives of the coast of Coromandel, Chuliais, and Klings (Telingas); Hindustanees, Javanese, Bugis, and Balinese; Caiffres, Siamese, and Parsees; of these the Chinese and Malays are by far the most numerous. In 1836 there were 12,870 Chinese men and only 879 women; of Malays there were 5,122 men and 4,510 women. But these censuses do not include the military, their followers, nor the convicts, as Singapore is a place of banishment from Calcutta and other parts of Hindustan. The number of these classes of inhabitants may be estimated at about twelve hundred. The Europeans and Chinese constitute the wealthier classes. The Europeans are for the most part merchants, shopkeepers, and agents for mercantile houses in Europe. Most of the artisans, labourers, agriculturists, and shopkeepers are Chinese. The Malays are chiefly occupied in fishing, collecting sea-weed, and cutting timber, and many of them are employed as boatmen.
and sailors. The Bungs are almost invariably engaged in commerce, and the natives of India as petty shopkeepers, boatmen, and servants. The Chuliahs and Kinglings are daily labourers, artisans, and petty traders. The Caffres are the descendants of slaves, who have been brought by the Arabs from the Arabian and Abyssinian coasts. The most useful are the Chinese settlers. A common Chinese labourer gets from four to six Spanish dollars a month, a Kling from three to four and a half, and a Malay from two and a half to four and a half. A Chinese carpenter will earn about fifteen dollars a month, a Kling eight, and a Malay only five. The immigration of the Chinese is much favoured by circumstances. Among the dense population of China there are many paupers, who are a burden to the state, and the government connives at the poorer classes quitting the country, though it is contrary to their ancient laws. The poor Chinese leaves his country without a penny, and agrees with the captain of the junk to pay from eight to twelve dollars for the passage. On landing he enters into one of the secret societies, which are always formed by the Chinese, and the petty profits of cases he pays to his services. In three months he has generally paid his debt, and then he begins to make his fortune. The Chinese emigrants at Singapore and Penang are mostly from Canton, Macao, or Fokien. Many of those of Fokien become merchants, and show a strong propensity to speculate largely. The Canton emigrants are the richest.

The territories of this settlement embrace a circumference of about a hundred miles, including the seas and straits within ten miles of the coast of the island of Singapore, and they lie between 1° 8’ and 1° 32’ N. lat., and between 103° 30’ and 104° 10’ E. long.

The island of Singapore occupies about half the space between the two capes with which the Malay Peninsula terminates on the south, Capes Buru and Ramdina (commonly called Romania). It has an elliptical form, and is about twenty-five miles in its greatest length from east to west, and fifteen in its greatest width. It contains an estimated area of about two hundred and seventy-five square miles, and is about one hundred and sixty-five feet above sea level. The soil is productive of rich rice and sugar cane. The eastern and western portions of maritime Asia.

The surface of the island is gently undulating, here and there rising into low rounded hills of inconsiderable elevation. The higher ground rises in general not more than a hundred feet above the sea; the highest hill, called Bukit Tima, which is north-west of the town, but nearer the northern than the southern shores of the island, does not attain two hundred feet. The shores of the island are mostly low, and surrounded by mangrove-trees. In a few isolated places low rocks approach the sea, chiefly along the Salat Tabræo. In several places, however, the coast is indented by salt creeks, which sometimes penetrate into the land three and even five or six miles. When the island was first occupied by the British, it was entirely wild and is still for the greater part, covered with a forest composed of different kinds of trees, five or six of which are well adapted for every object of house-building. The soil of the interior is composed of sand and of clay iron-stone, mixed up with a large portion of vegetable matter, which gives it a very black appearance. There is a general tendency to the formation of swamps. Rain-forests are numerous, but they are of an insignificant size. Their waters are almost always of a black colour, disagreeable taste, and peculiar odour, properties which they appear to derive from the peculiar nature of the superficial soil over which they pass, which in many parts resembles peat-moss. The water, however, drawn from wells which are sunk lower than the sandy base is less sensibly marked by these disagreeable qualities.

The climate of Singapore is hot, but equable, the seasons varying very little. The atmosphere throughout the year is serene. The smooth expanse of the sea is scarcely ruffled by a wind. The destructive typhoons of the China Sea, and the scarcely less furious tempests which occur on the coasts of Hindustan, are not known. The seas and tempests of the China Sea sometimes occasion a considerable swell in the sea, and a similar but less remarkable effect is produced by a tempest in the Bay of Bengal. It is only in this way, and as it were by propagation, that the sea is affected by remote tempests, and their effects are particularly remarkable in the irregularity of the tides, which at times run in one direction for several days successively, and with great rapidity. In the numerous narrow channels which divide the smaller islands, their rapidity is sometimes so great that it resembles water issuing through a sluice. The regular and periodical influence of the monsoons is slightly felt, the winds partaking more of the nature of land and sea breezes. The greatest number of showers. Few days elapse without the occurrence of rain. According to an average of four years, the number of rainy days was one hundred and eighty-five, and that of dry only one hundred and eighty. The greatest quantity of rain falls in the months of January and February, and the smallest in April and May. These frequent rains keep the island in a state of perpetual verdure.

The thermometer ranges during the year between 72° and 88°. The mean annual temperature is 80° 7½. Fahrenheit. In the four months succeeding February it rises to 82° 7½, and in the four months succeeding October it sinks to 79°. The daily range of the thermometer never exceeds ten degrees. Crawford states that the climate of Singapore is remarkably healthy, which he attributes to the free ventilation that prevails, and to the almost entire absence of chilling land-winds, but Newbold* thinks that it is not so healthy as Malacca, and he ascribes this to the less regular alternation of the land and sea breezes.

Singapore is not rich in agricultural productions. No part of it was cultivated when the British took possession of the place, and at first the soil was considered ill adapted for agricultural purposes. But it now appears that considerable tracts near the town have been cleared by the Chinese, and that this industrious people are succeeding in cultivating different kinds of fruits and vegetables, rice, coffee, sugar, cotton, and especially pepper and the betel-vine (Piper airiibos) Only the summits of the higher grounds are barren, but on their slopes and in the depressions between them the soil frequently has a considerable degree of fertility. Tropical fruits succeed very well, and pepper is produced in considerable quantities. The climate of Singapore is also very favorable to the propagation of all kinds of trees, which continue to flourish on the land three and even five or six miles. When the island was first occupied by the British, it was entirely

* Lieut. Newbold's Political and Statistical Account of the British Settlements in the States of Malacca, to which we are indebted for many of the statements in this article.
teem, pine-apple, cocoa-nut, orange, and mango. The mango is found wild in the forests. The tropical vegetables, as the egg-plant, different kinds of pulse, the yam, the batata, different varieties of cucumber, and some others, grow very well, but the climate is too hot for most European vegetables. The produce of the paddy-fields, as well as of the orchards, is far from being sufficient for home consumption, and accordingly large quantities of rice are imported from Sumatra and Java, and fruits from Malacca.

The animals of Europe have been introduced, but most of them are few in number, as pasture-grounds are scarce. The Chinese, however, keep a great number of hogs. None of the large quadrupeds of the continent of Asia, such as elephants, rhinoceroses, tigers, and leopards, are met with on the island, but there are several kinds of monkeys, bats, and squirrels; also the fctides, the porcupine, the sloth (Bradypus didactylus), the pangolin, the wild hog, and two species of deer, the Moschus pygmaeus, which is smaller than an English hare, and the Indian roe (Cervus munjac). Sometimes the dugong (Halocera Tagonia) is taken in the straits. It is ten or twelve feet long, and the flesh is considered for flavour and delicacy not inferior to beef: the skin is as strong as that of the hippopotamus. Birds are numerous, especially different kinds of passerses, climbers, and waders, particularly the first, which are remarkable for their novelty and beauty. Tortoises and vipers are common. The fish in the vicinity of Singapore furnish that delicate fern-like sea-weed called aggar-aggar (Fucus Saccharinus) in abundance, and it forms an article of considerable export to China, where it is used in thin glues and varnishes. It is made into a very fine jelly by Europeans as the native Portuguese. The average annual production is 6000 per cent. or 7980 cwt., and it is sold at three dollars the pecul.

The town of Singapore stands on the southern shores of the island, in 1° 17' 22" N. lat. and 103° 51' 45" E. long., on a level and low plain of inconsiderable width, fronting the harbour. It extends about two miles along the shore, but only a thousand yards inland, where it is enclosed by hills from a hundred to a hundred and fifty feet high. The commercial portion of the town occupies the most western extremity, and is separated from the other parts by a salt creek, called the Singapore river, which is navigable for small craft. A good wooden bridge connects it with the eastern part, which contains the dwellings of the Europeans, the public offices, and the military cantonments. Continuous to this portion of the town is the government-house, which is built on a hill. The most eastern part is occupied by the sultans of Johore, the Malays, and Bugis. The whole of the warehouses, and all the dwelling-houses in the principal streets in their vicinity, are built of brick and lime, and roofed with red tiles. The more distant dwelling-houses are built of wood, but roofed with tiles. It is only on the distant outskirts of the town that there are huts with thatched roofs. The Malays and Bugis live in huts. The population (16,148 individuals) consisted, in 1836, of 8233 Chinese, 3617 Malay, 2157 Chuliah and Klinga, and the remainder was made up by Javanese, Bengalees, Bugis, native Christians, and Europeans. Ships lie in the roads of Singapore at the distance of from one to two miles from the town, according to their draught. With the assistance of lighters, cargoes are discharged and taken in with scarcely any interruption throughout the year. The lighters convey the goods to the river of Singapore, where they discharge them and bring them out again at the door of the principal warehouses. There is no want of common artisans. The Chinese follow the occupations of shoemakers, bakers, butchers, blacksmiths, gunsmiths, goldsmiths, and carpenters; they also manufacture pearl sago on an extensive scale, for the European market, the material being obtained from the island of Sumatra. They also employ a great number of forges, in which native arms and domestic and agricultural implements are made. These latter articles are mostly sent to the settlements of the Chinese on the islands of the Indian Archipelago.

The principal public buildings at Singapore are the government-house, a court-house, a gaol, custom-house, Mission chapel, and the Singapore Institution. Sir Stamford Raffles formed a very extensive plan for this institution, which, however, has not been carried into effect. At present it consists of three schools, English, Malay, and Tamil, and the number of scholars amounts to upwards of seven hundred. A Chinese school on a large scale was contemplated in 1837, and has probably been opened. Some Chinese youths are to be admitted as students, to reside at the institution, and to receive instruction both in English and Chinese for four or five years. There are several native schools in the town.

The effect of the policy adopted in the establishment of a free port has been very apparent. In the first year, the exports and imports by native boats alone exceeded four millions of dollars, and during the first year and a half no less than 2889 vessels entered and cleared from the port, of which 383 were owned and commanded by Europeans, and 2506 by natives: their total tonnage amounted to 659,000 tons. In 1836 the total number of vessels entered was 130,689 tons, and the total value of exports and imports to upwards of eight millions of dollars. In 1836 the number of ships entered inwards was 539, the tonnage 166,053; ships outward 533, tonnage 165,417.

This statement however does not include the native craft, which are largely used in the intercourse with Java, and the Malay Peninsula, Rhio, Borneo, and the neighbooring islands, and which in 1836 amounted to 1484, of 37,521 tons, giving a total amounting to 203,574 tons entered at the port in that year. For a more detailed account of the commerce of this rapidly improving settlement, the reader is referred to the "Penny Cyclopedia," vol. xxii., and to Lieut. Newbold's "Coromandel," where it will probably increase largely in the next few years. If the Chinese government continue the vexatious restrictions on our commerce at Canton, it may be expedient to discontinue the direct commercial intercourse with the Celestial empire. Instead of Canton, the settlement of Singapore would be the market to which tea and other articles of Chinese manufacture may be brought, and on which a demand for them would be created. It is probable that the Chinese would seek our vessels for tea and other articles at least 10 per cent. less than we pay for them at Canton; besides, the tea is brought to Canton by a transport over land of many hundreds miles, whilst the countries in which it grows are near the sea; and it could be brought directly to Singapore, at much less expense. The only difference would be, that our vessels, instead of proceeding to Canton, would stop at Singapore; but that can hardly be considered a loss, when we reflect that the increased con-
sumption of Chinese goods, in consequence of the decrease in price, would certainly be attended by an increase of our shipping.

OLD AND NEW MODES OF RENDERING MEAT CHEAP.

In the year 1529 an act was passed entitled "An Act for the bringing up and rearing of Calves, to increase the multitude of Cattle;" and the preamble set forth that "forasmuch as of old time great multitude of cattle was yearly increased by weaning, bringing-up, and rearing of calves throughout this realm, whereby the number of oxen, kine, and steers were in such abundance and plenty, that beef and all other victual was good cheap, and sold to the king's subjects at reasonable pennyworths and prices, until now of late years past, that the breeders of such calves, of their covetous minds, have used to sell their calves young sucklings to butchers; weaning, rearing, or bringing-up few or none, whereby the increase of old cattle, and also the increase that should or might have come or grown of the same, is marvellously diminished and decreased;" and "the great diminishing and impairing of good hospitality" is pointed out as one of the consequences of this state of things. To correct this, all restrictions were removed relative to the killing of calves, although the measure was adopted to provide for the bringing up and rearing of calves, introducing a provision which was not in the preamble, the rise of prices would have been quite as efficacious as a prohibitive enactment. The remedy adopted does not appear to have been very successful, for, three years afterwards (in 1532) an act was passed for compelling the butchers to sell by weight; and the preamble of that act states that "the price of meat has increased so much, that out of necessity and sustentation of them, their wives, and children; but now, gracious Lord, all victual, and in especial beef, mutton, pork, and veal, which is the common feeding of the mean and poor persons, are so sold at so excessive a price, that your said needy subjects cannot gain with their labour and salary sufficient to pay for their convenient victual and sustenance." The chief clauses of the statute required butchers to sell by weight, "the meat to be cut in reasonable pieces, according to the request of the buyer," and the prices were fixed; thus beef and pork were to be sold at a halfpenny per lb. whereas only a year or two before, they sold at a less price. This very reasonable attempt to coerce the butchers, and, at a period when prices were generally advancing, to fix the price of their commodities, could not succeed, as men would soon forego an occupation which the law rendered unprofitable, the market would be badly supplied, and some more stringent course would become necessary, and which, in the end, would as certainly fail. The year following the passing of the above act, another act was passed for enforcing it in a more summary manner. It authorised mayors and sheriffs to commit butchers who sold above the statute prices, and to sell their stock for them, the butcher, however receiving the proceeds. Another clause shows that it was not necessary to deal with the butchers alone, who naturally refused to carry on a losing trade; and the justices of the peace were required to assess the price of fat cattle whenever the farmers and graziers refused to supply the butchers at "reasonable" prices, and if the farmer did not accept such price, then he was bound to appear in the Star Chamber. It is true that there is a glimpse of good sense in a clause which enabled the king to suspend the law by proclamation, but an apology was made for such a deviation from the maxims of political economy which were usually recognised in the practical legislation of that age.

At the present time, the price of meat has for some years been so high as to encourage an idea that speculators might realise a profit by breeding fresh water fish in artificial ponds, but a much more rational mode is proposed by the government, which is, to increase the supply of meat. At present, the importation of live cattle and fresh meat is entirely prohibited, but it is intended to admit oxen at a duty of 20s. each; cows, 15s.; calves, 10s.; sheep, 3s.; lambs, 2s.; and pigs, 5s. Fresh proof, or beef snug, if salted, which is now prohibited, will be subject to a duty of 8s. a cwt. from foreign countries, and 2s. if from British possessions. The duty on bacon and hams is to be reduced from 28s. to 14s. per cwt.; on salted beef and salted pork a reduction is to be made from 12s. to 8s.; and a lower duty is to be charged on these articles of provision when imported from our colonies. Land will be reduced from a duty of 8s. to 2s., and to 6d. if from a British possession. No reduction is intended in the duty on butter and cheese from foreign countries, which is now 20s. and 10s. a cwt., but a lower rate of duty (5s. and 2s. 6d.) is to be charged on these articles when imported from our dependencies.

It is singular that the prices of beef and fresh meat have continued prohibited articles under each of the great revisions of the tariff which took place in 1787, 1809, 1819, 1825, and 1833, while at the same time we have been annually importing large quantities of butter, cheese, tallow, hides, skins, wool, and a considerable amount of salted beef and pork; and even bones, to the extent of something like 200,000 cwts. per annum. Thus in the year ending 5th January, 1842, we imported, omitting fractional sums—

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>251,000 cwts. of butter,</td>
<td></td>
</tr>
<tr>
<td>248,000 do. cheese,</td>
<td></td>
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<tr>
<td>456,000 do. hides,</td>
<td></td>
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<tr>
<td>473,000 do. wool,</td>
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<tr>
<td>1,255,000 do. salted beef,</td>
<td></td>
</tr>
<tr>
<td>30,000 do. salt beef,</td>
<td></td>
</tr>
<tr>
<td>6,000 do. bacon and hams,</td>
<td></td>
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</tbody>
</table>

being about 134,000 tons of produce derived from living and dead animals, while the animals themselves were altogether excluded.

In 1666 we were patriotic enough to pass an act prohibiting the importation of Irish cattle, sheep, and swine, and of Irish beef, pork, and bacon, declaring the trade to be a "common nuisance." One of the wise consequences of this measure was to enable the French navy to be victualled from Cork at a cheaper rate than our own. A writer of 1670 says, "The ends designed by the acts against the importation of Irish cattle, of raising the rents of the lands of England, are so far from being attained, that the contrary hath ensued." In 1759 the act was repealed, but until a better policy prevailed it may be considered rather as having been suspended; and Adam Smith, writing nearly twenty years afterwards, notices "the small number of Irish cattle imported since their importation was permitted." The case is very different now, not only in consequence of an increased demand in England, but from greater facilities of shipment. "Before the establishment of steam-navigation, many inconveniences and difficulties attended the transport of Irish cattle. Many of them were driven a hundred or a hundred and fifty miles to the coast, where, if the wind was contrary, they were detained perhaps several days, with a very scanty allowance of food. They had
none on the voyage; and when they had arrived at the English shore, they were often in a starved state, and scarce able to walk." The construction of canals and the improvement of rivers in Ireland, some of which are navigated by steam-boats, render even the journey to the coast as easy and rapid as across the Channel, while the verdant pastures of the Green Island are better adapted for grazing than many of the English counties, especially those in which the great manufacturing towns of Liverpool, Manchester, and Leeds are situated. Cattle dispatched from Ireland on one day, may, without any of the uncertainties of sailing vessels, reach the markets of Lancashire early on the following day; or they may be slaughtered in the afternoon of one day, and the next morning the carcasses may be cut up in the butchers' shops at Liverpool and Manchester; and since the opening of the great lines of railway, both live and dead cattle from Ireland are supplied to a much greater distance from the English port than formerly. In 1836 the freight of cattle from Dublin to Liverpool was from 5s. to 12s., according to their size; sheep were 2s. per head, and pigs from 1s. 6d. to 4s. each; from Derry to Liverpool a fat cow could be conveyed for 10s. 6d.; sheep, 1s. 10d.; lambs, 1s.; and from other ports in the same proportion. A fleet of about eighty steamers, many of them very fine and large vessels, is now daily constantly passing to and fro all the ports of Ireland between Cork and London-derry, to the ports of Great Britain, from Bristol to Glasgow, making probably altogether not much less than from 8000 to 10,000 voyages a year. From Dublin to Liverpool nine-tenths of the cargoes consist of live-stock. In the ten years from 1825 to 1835 the import of cattle increased from 274,000 to 478,000 in number. In these ten years the exports of Ireland, which consist almost entirely of agricultural produce, increased from 9,243,000L. to 16,693,000L. In the course of time, under the proposed new tariff, there will doubtless be a very large increase of those articles of foreign production which comprise some of the most necessary articles of daily consumption. From the Baltic to the Tagus there is a constant commercial intercourse with Great Britain by steamers of large size, which perform their voyages with a certainty and rapidity previously unknown. New York, Boston, and Halifax, by means of the splendid steamers which cross the Atlantic, are reached within twelve days of the night's distance. With the West India Islands and the Gulf of Mexico, from New Orleans to Guiana, the intercourse with England is already about to be carried on by steam-boats; and with Rio Janeiro and Buenos Ayres a more rapid communication with England will in no great length of time be opened by means of steam-navigation; and we shall doubtless receive from these places a variety of articles which nobody would have thought of committing to the uncertainties of the winds.

The countries nearest to England are unable to spare a supply either of cattle or meat. France and Belgium are under the necessity of importing both, and they receive the supplies from Holland and Germany. Proceeding farther northward the supply is greater than the demand for home consumption, and there will in all probability be a considerable quantity of corned and slightly salted meat, if not of cattle, sent to England. It is remarkable, also, that wherever a communication by steam exists between England and any part of the Continent, the greatest exertions have been made to extend the facilities of communication with the ports of shipment, in order that the internal parts of the country might benefit by the rapid communication with the English coast.

Hamburg, which is the natural emporium of the countries watered by the Elbe, exports annually 7,500,000 lbs. of salted meat, including bacon and hams, or about 3500 tons. The average price is 50s. per cwt. of 180 lbs. An ox weighing 550 lbs. sells usually for about 12s. 6d. per lb. At Hamburg there would be 20s.; cows sell for 10s. or 11s.; the sheep are small, and one of 60 lbs. sells for 20s. The prices of meat are 3d. to 4d. per lb.; veal and mutton 5d. and 6d. At Kiel, an ox of 600 lbs. sells for only 71s.; and a sheep of 80 lbs. for 20s. Fresh meat is from 4d. to 6d. per lb. At Lubeck the price of an ox weighing 700 lbs. in the same proportion. Both mutton and salted meat is 3d. to 3½d.; and veal, mutton, and pork are 4d. per lb. At Stettin meat is about the same price, with the exception of mutton, which is from 2½d. to 3d. per lb., and salted beef or pork is from 5d. to 6d. per lb. At Dantzic, an ox of 550 lbs. may be bought for 8½s.; and meat of all kinds is 4d. per pound. Hams are 4½s. per cwt.; salted meat is 4d. per lb.; and pork 6½s. per barrel of 196 lbs. At Elsinore salted meat is lower than at Dantzic.*

Of all the places Hamburg is most celebrated for the excellence of its salt meat, which includes beef, pork, bacon, veal, mutton, and smoked beef. A navy tierce of salt beef, containing 38 eight-pound pieces, would cost 4s. 3½d.; the freight, insurance, and other charges would be 5s.; to which must be added the duty of 8s. the cwt. A navy tierce of pork, containing 80 four-pound pieces, is subject to exactly the same charge, and would cost 4½s. Hamburg could export at present about 1,800,000 lbs. of salted beef, and 3,000,000 lbs. of salt pork. With the prices above mentioned, it is said that a profit could be made from 10s. to 17s. 6d. per tierce on the importation of salt beef and pork into England. Smoked beef, which loses about 25 per cent. in drying, costs about 5½d. per lb.

Dantzic is attempting to rival Hamburg in the salt provision trade, and is quite successful as regards pork, which is all corn-fed; but the oxen are not so well adapted for picking, in consequence of being worked in the plough for four or eight years, and then chiefly fed on the refuse of the distilleries.

Under a low rate of duty salt meat could be supplied at a cheaper rate from South America. Sir Woodbine Parish states that "a Guacho would at one time kill an ox for the tongue, or any other part of the animal he might fancy for his dinner, and leave the rest of the carcass to be devoured by the vultures, or by the wild dogs;" but there is now less waste. Jerked beef is extensively exported from Buenos Ayres to Brazil and Cuba, but its importation is not allowed in our West Indian colonies, although, as Sir Woodbine Parish states, the best quality might be delivered there under 2d. a lb. allowing for a moderate duty.* It is extremely wholesome food. The "charke" (dried beef) of Chili is prepared in such a manner as to be fit for export, and can be sold at the rate of 2d. and 3d. per lb. A brief account of preparing it is given in Sutcliffe's 'Sixteen Years in Chili.' It is the common food of the Chilians, and is eaten either roasted, boiled, or made into a mess. Should the importation of animal food take place to any great extent, it would prove a great advantage to the most laborious part of the population, who in too many cases scarcely taste meat from one year's end to another.

* Cattle-Library of Useful Knowledge,' p. 186.

+ Mr. Meek's 'Report to the Government,' Dec., 1841.

† 'Buenos Ayres,' &c., by Sir Woodbine Parish, p. 348.
THE ACACIA, OR LOCUST-TREE.

This tree is a native of North America, where three varieties are common, the red, green, and white, so called from the colour of the heart-wood; and in the Western states there is a variety known as the black locust, but the variations are probably occasioned solely by differences of soil, situation, and climate. Where these are favourable, the locust-tree attains a height of seventy or eighty feet, and the trunk varies from two to three or even four feet in diameter; but as it is very seldom found growing straight to any considerable height, the timber is not adapted for so many useful purposes as might be inferred from its valuable qualities. The very numerous branches often contain as many cubic feet as the main trunk. The branches are armed with strong hooked spines. The leaves, which close themselves at night, are remarkable for their smoothness, and while the sycamore especially, and many other trees, soon lose their freshness and verdure when planted by the side of a public road, the dust will not lie on the smooth surface of the locust-leaf. The tree produces white or yellowish flowers, which hang very gracefully in bunches, and are of an agreeable fragrance, retaining their perfume after being gathered, and forming by decoction a very pleasant beverage, while the roots have a saccharine flavour resembling liquorice. The locust-tree commences forming heart-wood in its third year, a peculiarity which distinguishes it from other trees, in which this operation does not usually take place until the tenth or fifteenth year. There are two other species of the locust-tree cultivated in England, one distinguished by the clammy secretion of the bark, and the other by the size and beauty of its flowers, which renders it a great ornament of the lawn and shrubbery. It is often trained on an espalier rail or against a wall, and a hedge formed of this species is a very beautiful object in the flowering season.

The locust-tree has been extensively propagated in Europe, especially in France and England. It is
named in honour of Robin, a French botanist, who was gardener, herbalist, or arborist to Henri IV.; and Vespasian Robin, son of the above, is said to have been the first who cultivated the locust in Europe. In Parkinson's 'Theatre of Plants,' published in 1640, it is said that specimens of good size were then growing in Tradescant's garden at Lambeth; and as no allusion is made to the tree either in the first or second edition of Gerard's 'Herbal,' published in 1597 and 1629, it is to be presumed that the date of its first introduction into England was not earlier than the last-mentioned year.

In 1664 Evelyn published his 'Sylva,' and the locust-tree had then been extensively planted in St. James's Park. From that period to the present it has been treated with singular caprice—at one time extolled beyond its deserts; next visited with the contumely and scorn which befalls discarded favourites; and after this fluctuation of opinion, it has again been received into public favour. Its merits are now sufficiently well known, and it will be difficult for any one to remove it out of the rank which experience has assigned to it. About twenty years ago the late Mr. Cobbett produced quite a mania for the locust-tree in this country. He wrote its wood 'is undeniably very rapid. In the course of four years coming out late in the spring and falling off early in the autumn, occasions their being neglected for many years; but of late they have been much in request again, so that the nurseries have been cleared out of those trees, though in a few years they will be as little inquired after as heretofore, when those which had then been extensively planted in St. James's Park, are stated by a writer in 1712 to have been cut down "in consequence of some of their branches being broken by the wind." Miller, in the sixth edition of his 'Dictionary,' published in 1752, remarks that locust-trees 'were' at one time very highly prized in England, and were frequently planted in avenues and for shady walks; but their branches being generally broken or split down by the wind in summer, when they are clothed with leaves, the trees are rendered improper for this purpose, and their leaves being burnt in the spring, and the twigs and branches disposed of early in the autumn, occasioned their being neglected for many years; but of late they have been much in request again, so that the nurseries have been cleared of these trees, though in a few years they will be as little inquired after as heretofore, when those which had then been lately planted begin to have their ragged appearance.'

The growth of the locust-tree in a good sandy loam is said to be more rapid. In the course of four or five years it has been known to attain a height of sixteen and even nineteen feet, and many persons were induced to plant it extensively for hop-poles; but it does not grow straight enough for this purpose, and it is not more durable than the poles of other trees. In ten years the locust-tree reaches a height of twenty, thirty, and even forty feet, when its increase is slow. It attains maturity at the age of thirty or forty years, but seldom contains more than forty or fifty cubic feet of timber. A tree at Tavenham, Norfolk, contained eighty-nine feet and a half, but this was regarded as an extraordinary specimen, and the silver firs which had grown up along with it contained one hundred and fifty feet of timber. Mr. Loudon has industriously collected, in his 'Arboretum,' the result of various experiments made at the government dock-yards and elsewhere to determine what the actual qualities of the locust-tree really were; and from these investigations it appears first that the wood of the red species, grown in good soil and open, is heavier, harder, stronger, more rigid, more elastic, and tougher than the best English oak. But then the form of the tree is such that it furnishes timber for only a limited number of useful purposes. Its superioriority for trelinais, used in ship-building instead of iron bolts, is undeniable, and it is in consequence imported for the government and other building-yards.

For posts and fences it is also found very valuable both in Europe and America, and in the latter country it is preferred to all others, except the red mulberry, in the putting together of frame or half-timbered houses. The cabinet-makers work up the locust-tree in America, and it is used by turners as a substitute for box. When a fence is made from the wood of young trees, it does not appear to possess more durable qualities than the ash or other common trees.

The locust-tree is a great ornament to the lawn, where it should stand singly, and if planted in groups in the shrubbery, ample room should be allowed for the development of the branches, and at the same time they should be sheltered from the most violent winds. Though its drip is less injurious than to any other tree to any kind of vegetation which it overhangs, yet as the roots spread laterally at no great depth below the surface, it exhausts the soil in its neighbourhood. Gilpin remarks, in his 'Forest Scenery,' that the locust-tree is generally called the acacia, "of all trees the least able to endure the blast. In some sheltered spot it may ornament a garden, but it is by no means qualified to adorn a country. Its wood is of so brittle a texture, especially when it is encumbered with the weight of foliage, that you can never depend upon its aid in filling up the part you wish. The branch yet alive to-day, may be demolished to-morrow. The misfortune is, the acacia is not one of those grand objects, like the oak, whose dignity is often increased by ruin. It depends on its beauty, rather than on its grandeur, which is a quality more liable to injury. We may add, however, in its favour, that if it be easily injured, it repairs the injury more quickly than any other tree. Few trees make so rapid a growth." The locust-trees which Evelyn notices in 1666 as having been planted in St. James's Park, are stated by a writer in 1712 to have been cut down "in consequence of some of their branches being broken by the wind." Miller, in the sixth edition of his 'Dictionary,' published in 1752, remarks that locust-trees 'were' at one time very highly prized in England, and were frequently planted in avenues and for shady walks; but their branches being generally broken or split down by the wind in summer, when they are clothed with leaves, the trees are rendered improper for this purpose, and their leaves being burnt in the spring, and the twigs and branches disposed of early in the autumn, occasioned their being neglected for many years; but of late they have been much in request again, so that the nurseries have been cleared of these trees, though in a few years they will be as little inquired after as heretofore, when those which had then been lately planted begin to have their ragged appearance.'

**THE BASQUE PROVINCES.**

The three provinces known by the name of the Basque Provinces occupy a territory of a form almost triangular, between 42°25' and 43°25' N. lat., and 1°40' and 3°25' W. long. It is bounded on the east by France and Navarre, on the west and the south by Old Castile, and on the north by the ocean. The provinces are, Guipuzcoa on the east, Viscaya on the west, and Alava on the south. The territory is exceedingly mountainous, being traversed by the offsets of the
great Pyrenean chain, called by some geographers the Cantabrian Pyrenees. The different branches of that chain form the border of the former province. The mountain of Jaizkibel, which extends from Cape Higuer to Passages, on the coast of Guipuzcoa, is chiefly composed of sandstone, which is used in building. From Orio to San Sebastian, in the same province, another mountain extends, on the highest point of which, called Igueldomendi, stands the lighthouse of San Sebastian, visible at the distance of thirty miles at sea. In the district of Irun is the mountain of San Marcial, celebrated in the late Peninsular war. The mountains of Vizcaya are chiefly composed of calcareous rock and sandstone, and abound in iron. Marbles of various colours are also found in different parts of the province. In the three provinces the mountains are well covered with fruit and timber trees. The principal rivers are the Ebro, Euskadi or Euskerr, the Tarna, the Leza, the Bidassoa, which separates Frantzi from Guipuzcoa. The aspect of the country is very picturesque, and the soil, although it is chiefly composed of clay, is rendered very productive by the industry of its inhabitants. From a very early period they have mixed the clay with calcareous earth. The principal products are wheat, barley, pulse, flax, hemp, and pasture. Alava produces also oil, and a weak sort of wine, called chaccoll by the inhabitants; but the principal beverage of the Basques is cider. The climate is healthy, and though very damp and cold in the highlands, is temperate in the valleys. The chief towns in Guipuzcoa are, Fuente-Rabia, at the mouth of the Bidassoa; Passages, celebrated for the security of its harbour; San Sebastian, the capital of the province; and Guetaria, the birth-place of Sebastian de Elcano, a celebrated navigator of the sixteenth century, who first circumnavigated the globe. In Vizcaya, Motrico, Lequeitio, Bérraco, Bilbao, the capital, and Somorrostro, celebrated for its iron-mines. In Alava the chief towns, besides the capital, Vitoria, are Salvatierra, Lequiano, and Gamboa.

The population of the three provinces, according to Miñano, amounts to 342,929 souls. The people live for the most part on isolated farms, scattered over the country, there being in the three provinces few large towns; the greatest part of these farms are cultivated by the proprietors. Guipuzcoa is the best peopled, not only of the Basque, but of all the provinces of Spain; and was presided over by the count of Navarre, who had the title of Duke of Cantabria, and perished with King Don Rodrigo at the battle of Guadalete, in 717. In the year 1200, Alfonso VIII. of Castile, in his wars against the king of Navarre, invaded Alava and Guipuzcoa, and those provinces were united to Castile, the king taking the customary oath to maintain their privileges. The Lord of Vizcaya was already an ally of the Castilian king.

The Vizcayan historians count nineteen lords, the last of whom was Nuño de Lara, after whose death the lordship was successively in the possession of Pedro the Cruel, of Castile, his brother Don Tello, and Don Juan of Aragon. After the defeat of Pedro in this latter battle, the latter conferred the title of Lord of Vizcaya on his eldest son, afterwards Juan I. of Castile, from which time the kings of Castile have had that title.

The government of the Basque provinces differs entirely from that of the rest of the Peninsula. Every province has its own constitution, and a separate government, not differing much in spirit and form from each other. The people of Alava, at a very remote epoch, which some historians suppose to have been prior to the invasion of the Arabs, appointed their civil and military governors at a general assembly. This assembly met every year in the Campo de Arriaga, a plain near Vitoria. It was composed of the bishop and archdeacon of Calahorra, of all the secular clergy...
of the province, and all the principal men; including also ladies, who were the representatives of their families. This junta was afterwards known under the name of the Junta de la Merindad de Arribas. They elected four alcaldes for the civil and judicial administration of the province, and a military governor, who was called duke, count, or lord. In the year 1467, at an assembly held at Rivabellosa by order of Enrique IV. of Castile, a collection of the laws and privileges of Alava was formed and approved; and by that code they are governed at present. According to this code, a Junta-General is held at Vitoria every year, at which two commissaries are elected, one of whom must be a citizen inhabiting one of the towns, and another from the small villages. There is also a Diputado-General, who presides at the assemblies, but has no voice in them; he commands the forces of the province, and communicates with the government of Madrid. The province is divided into fifty-three Hermandades, administered by seventy-five Alcaldes, elected at the Junta-General.

The Guipuzcoans, according to their present constitution, hold a Junta-General, or general assembly, every year, in the month of July, at one of the eighteen towns mentioned above. At this assembly are diputados-generales, who must be domiciled at San Sebastian, Tolosa, Azpeitia, or Azcoitia. These diputados, who are elected for one year, form the Diputacion, which is the government of the provinces; the government reside, in rotation, three years in each of the four towns just mentioned. There is also a Diputacion Extraordinaria, which is elected for four years. The first meeting is always held under an oak near the town of Guernica. There is also a Diputado-General, who presides at the assemblies, but has no voice in them; he commands the forces of the province, and communicates with the government of Madrid. The province is divided into thirty-five Hermandades, administered by seventy-five Alcaldes, elected at the Junta-General.

The Vizcayans hold a general assembly every two years. It is summoned by the Corregidor of Bilbao, and every town, village, or hamlet has one vote, and sends one deputy to it. The first meeting is always held under an oak near the town of Guernica. There is another junta, called the Junta de Hermandad, which is held at Bilbao, and in which one of the towns has a vote, each succeeding year. The first meeting is held at Vitoria, and points every year, by lot, the Diputacion, which is composed of two diputados, six regidores, two syndics, and two secretaries. The two diputados are sometimes appointed by acclamation of the junta. The Junta de Merindad is very often more powerful than the Junta-General; and the laws enacted in it have the same force as those made in the latter assembly.

The Diputacion is entrusted with the administration of the province; it receives and expend the public funds, disposes of the forces for the defence of the state, gives letters of citizenship to strangers, and is the supreme tribunal of appeal in civil matters. There is no building belonging to the state; even the house of the Diputacion and the prisons belong to private individuals, who let them to the state. The people pay only one direct tax, which consists in a moderate rate for every house, and is equally divided, so that rich and poor contribute to the state the same sum. The revenues of the church are so scanty, that the richest abadia, or nunnery, is not worth more than 160l. per annum.

The chief privileges of the Vizcayans consist in paying no taxes except those levied by their juntas; in every Vizcayan being by birth an hidalgo, or gentleman, and acknowledged as such in every part of Spain; in not being subject to any tribunal, or to any other laws, except those of their own province or in any other part of the Peninsula, than their own, and in having a judge resident at Valladolid for the administration of those laws in cases occurring out of the province; in being exempt from military service, except in the defence of their own country; in the enjoyment of commercial liberty; and, finally, in not having any officers appointed by the government of Madrid, except the masters of the post-office. The Basques of all the three provinces also contribute to the royal exchequer a certain sum, which they call "donativo voluntario," or voluntary donation.

The Vizcayans and Guipuzcoans are the best sailors in commercial life, and skillful in commercial transactions. They are very active and industrious; their chief occupations are agriculture, commerce, and the manufacturing of iron. The women assist the men in the cultivation of the ground, and are remarkable for their cleanliness. Their manners are simple and easy. They are fond of dancing in their festivities, and enjoying the moderate pleasures of the table. Their national instruments are the tambourine and the bagpipe: their dance called zorrizo is quick and lively, and is always accompanied by singing. In their weddings they greet the bride in going to and coming from the church, by firing guns and pistols, and very often she is induced to fire them herself. In some villages they are very stubborn and intractable, and it is for that reason that any other animal, which they soften by soaking it in water, and then cut it into pieces of the size of the foot, which they fasten on with strings.

The Basques are in general frugal, cheerful, honest, and courteous, without meanness. When kindly treated, they are docile and manageable; but if they are dealt with severely and harshly, they become stubborn and intractable, and it is for that reason that they are with great difficulty subjected to severe military discipline, particularly by officers who are not of their own country. Gonzalo de Córdoba, from the experience he had of them in Sicily, often said that he would rather keep lions than Vizcayans. They are a brave people, and better adapted for a system of guerrilla warfare than any other in Spain.—Abridged from the Penny Cyclopaedia.

**Eastern Method of Measuring Time.**—The people of the East measure time by the length of their shadow. Hence, if you ask a man what o'clock it is, he immediately goes into the sun, stands erect, then looking where his shadow terminates, he measures his length against his feet, and tells you the time. Thus the workmen earnestly desire the shadow which indicates the time for leaving their work. A person wishing to leave his toil says, "How long my shadow is in coming?" "Why did you not come sooner?" Because I waited for my shadow." In the seventh chapter of Job we find it written, "As a servant earnestly desires his shadow."—Roberts's Illustrations.

**Railroads in Germany.**—The Prussian State Gazette gives the following summary of the actual state of railroads in Germany:

<table>
<thead>
<tr>
<th>Miles</th>
<th>Dollars</th>
</tr>
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<tbody>
<tr>
<td>Lines finished 1664</td>
<td>$3,940,000</td>
</tr>
<tr>
<td>Do constructing 1664</td>
<td>$43,357,000</td>
</tr>
<tr>
<td>Do granted 1245</td>
<td>$27,240,000</td>
</tr>
<tr>
<td>Do projected 332</td>
<td>$24,000,000</td>
</tr>
<tr>
<td>Do branches 193</td>
<td>$13,846,000</td>
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<td>---</td>
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</tr>
<tr>
<td>$139,086,000</td>
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A German mile is equal to 4 English miles, giving a total of about 4700 English miles.
WESTMINSTER BRIDGE.

The metropolitan world of the present and the latter half of the last century seems to have been seized with a very sudden and sweeping determination to get rid of a variety of circumstances which, however annoying or mischievous in themselves, have been borne most patiently by our forefathers from time immemorial. It is truly surprising to walk through the principal thoroughfares of London, and mark how entirely everything in the shape of street magnificence, street cleanliness, or street comfort that meets the eye belongs to the existing or the preceding generation. Let accident or necessity take us where innovation has not yet appeared, to any of those spots or districts, growing smaller and fewer every day, which yet preserve for our instruction a few glimpses of the over-hanging houses, the alley-like streets, the dim, the danger, and filth surrounding the whole, like another atmosphere, which so recently characterised London generally; and it does seem difficult to understand how senses of vision, hearing, or smell, constituted like our own, could have ever regarded such nuisances with complacency. It may be supposed that only the poorer and less prominent neighbourhoods or thoroughfares were of this kind. So far, however, was this from being the case, that the highway to and precincts of the chief courts of justice, of the houses of legislature, and of the great Abbey, the foremost objects of attention to all foreign visitors, the constant places of resort of all the most distinguished Englishmen, were but a century ago in a condition which we should say St. Giles's or Bethnal Green now but faintly emulates. But evidence will satisfy the most incredulous. On the 27th of January, 1741, Lord Tyrconnel, in moving for leave to bring in a bill for the better paving and cleansing the streets within the city of Westminster and the liberties thereof, and for preventing nuisances therein, said, "It is impossible, Sir, to come to this assembly, or to return from it, without observations on the present condition of the streets of Westminster, observations forced on every man, however inattentive, or however engrossed by reflections of a different kind. . . . The filth, Sir, of some parts of the town, and the inequality and ruggedness of others, cannot but, in the eyes of foreigners, disgrace our nation, and incline them to imagine us a people not only without delicacy, but without government; a herd of barbarians, or a colony of Hottentots." From other notices also, we learn that the Houses of Parliament were obliged, from session to session, to publish an order for the keeping clean the way for the members; and that when the monarch came by land to visit them, it was necessary to throw faggots into the ruts to enable the unwieldy vehicle of state to pass along with moderate ease. Who that now passes from Charing Cross into Westminster would suspect he was traversing the very localities which Lord Tyrconnel had in view in his description? But the reformation of the evils more particularly referred to by the noble lord, connected with the surface of the ground, is but a type of the greater changes that have here been wrought. Let us imagine ourselves following some foreign visitor from the City to Westminster a century ago. As soon as he turned the corner at Charing Cross, he entered a narrow street occupying the right side only of the space now forming Whitehall and Parliament Street, and which, nowhere very broad, measured in some parts scarce eighteen feet. Continuing his route between the walls of Whitehall on the left, and the Park on the right, near the Horse Guards he stopped to admire the stately proportions of the Banqueting House, almost the only part of the famous palace which the fire of 1607 had left entire; or to take a last look at Holbein's beautiful gate, which he would hear was likely, before long, to be removed,—the one loss among all the buildings and places to be swept away. Thinking of this gate, he would care little for the absence of the other also belonging to Whitehall, which had stood, but a few years before, at the corner of King Street and Downing Street, and over which Henry VIII. had been accustomed to pass from the chambers of the palace to regale himself with the pleasures of his tennis-court, his bowling-green, his cock-pit, or his tilt-yard, or merely with a simple walk in the park. As the stranger passed along King Street (presenting
here and there to this day the same aspect as of old), he had reason to be thankful if he got safely through without injury to person or apparel, from the confused throng of new-shops, horsemen, carts, and coaches jammed together in that narrow space; still more fortunate was he if some occasion of public ceremony, such as the king going to open Parliament, had not drawn him thither. It makes one's sides ache to think of being borne along with such a procession through such a place. Forgetting for a moment the disagreeables of the way, and the astonishment they bred in him, he would find the neighbourhood an interesting one. Near the end of King Street (which then extended to some little distance on the other side of the present Great George Street, which was not yet in existence), he beheld the place rejoicing in the name of Thieving Lane, through which felons had been formerly conducted (somewhat circuitously, in order to avoid touching the Sanctuary of the Abbey, where they must have been freed at once) to the gate-house or prison of the Abbot of Westminster, standing just by the beginning of Tothill Street; and close by was the famous Sanctuary itself, occupying the space where now stands the Sessions House. From King Street the road to the Abbey diverged towards the Thames, but then again turning to the right, passed between New Palace Yard and the old decaying houses which stood on that pleasant greenward we now see opposite the former with the statue of Canning conspicuous in front. This part was called St. Margaret's Lane, and a lane truly it was, hemmed in by fish-houses, horse- and cart-keepers, and by the ancient Palace of Westminster, where, among other curiosities about shortly to disappear, our visitor would see two old prisons of the regal habitation, known respectively as Heaven and Purgatory, in the last of which was preserved the ducking-stool which was employed by the burgesses of Westminster for the punishment of scolds. "The lady," he would be informed, if he was curious in such matters, "was strapped within a chair fastened by an iron pin or pivot at one end of a long pole suspended in its middle by a lofty tressle, which having been previously placed on the shore of the river, allowed the body of the culprit to be plunged in the water and water was poured into it with great force by the executioners. After some time, when the water had filled up the space, the body was raised by a boy, and by a hook behind the neck, pulled from the stream, and led to an adjacent house where it was methods of business which confined certain advantages to certain places, was displaced to make room for a structure which—long desired—was at last only achieved by a triumph over similar principles, and which was to open to Westminster a new career of improvement, not less important and much more brilliant than even the staple had done, which originally raised Westminster from a village to a town; in a word, our stranger, stepping from the Palace Yard into a narrower lane leading to the water (the site of which now forms one side of Bridge Street), beheld the work in progress which was the immediate cause of all the changes that rumour said was about to be made in the route through which he had passed,—he beheld the rising but unfinished piers and arches of the Bridge.

The change wrought on the other side of the Thames has been still more extensive, though none of the improvements attached to the removal of ancient and well-known building belongs to this subject; and down to the present century, when the fragments of eight figures in niches, of exquisitely wrought craftsmanship, were discovered. The gate of the Wool-staple opposite the Hall, the last remains of the establishment to which old Westminster owed so much, would be too late to see, as it had been lately (1741) removed, and noticeable was the occasion of that removal. The last relic of the old monopolising principles of business which confined certain advantages to certain places, was displaced to make room for a structure which—long desired—was at last only achieved by a triumph over similar principles, and which was to open to Westminster a new career of improvement, not less important and much more brilliant than even the staple had done, which originally raised Westminster from a village to a town; in a word, our stranger, stepping from the Palace Yard into a narrower lane leading to the water (the site of which now forms one side of Bridge Street), beheld the work in progress which was the immediate cause of all the changes that rumour said was about to be made in the route through which he had passed,—he beheld the rising but unfinished piers and arches of the Bridge.

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China has a soil and a climate which tend greatly to the growth of this kind of tree, and to this circumstance has been attributed the great success of the Chinese silk-culture in that country. The steps by which the knowledge of silk, as a material for clothing, reached those countries of Europe, shall not be here traced; but shall at once state that the rearing of silk-worms was first carried on in Italy about six hundred years ago. In the year 1327 the authorities of Modena drew a revenue from this source by the following extraordinary law:—That the proprietor of every enclosure should plant at least three mulberry-trees; and that every mulberry-plantation, which shall not hereafter be publicly sold in the market, the buyer and seller paying each a tax to the revenue. From Modena the rearing of silk-worms spread to other parts of Italy.

By degrees other countries were made the scene of attempts to naturalise this little worm. Louis XI. caused the establishment of plantations for this purpose; and by the time of Henri IV. the mulberry-tree and the silk-worm were located in Lyonnais, Dauphiné, Provence, and Languedoc. The last-named monarch extended the same system to the neighbourhood of Orleans, gave honours and dignities to the successful cultivators, and even directed his own attention to the rearing of silk at the Tuileries and Fontainebleau. It was found, however, subsequently, that none of the attempts to rear the worms in the northern parts of France were permanently successful; the quantity or the quality of the silk produced (or both) being insufficient to render the attempt profitable. For the last century the only parts of France where the rearing has been carried on, are the Dauphiné and Languedoc, and even here the attempts have not proved sufficiently successful to render the attempt profitable.

The success which attended the establishment of mulberry plantations in the south of France induced James I. to hope that a similar advantage might be available for England. After saying that "in a few years" he directed his ministers to obtain a grant for the propagation of mulberries in the southern regions of the provinces bordering on the Mediterranean. To induce the peasantry of these provinces to direct their attention to this subject, Colbert, the minister of Louis XIV., established nurseries for mulberry-trees, and presented the young trees to any peasant or farmer who wished to rear silk-worms; he also gave a reward of three livres to the cultivator, for every tree that should be found in a flourishing condition three years after it had been planted.

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By degrees other countries were made the scene of attempts to naturalise this little worm. Louis XI. caused the establishment of plantations for this purpose; and by the time of Henri IV. the mulberry-tree and the silk-worm were located in Lyonnais, Dauphiné, Provence, and Languedoc. The last-named monarch extended the same system to the neighbourhood of Orleans, gave honours and dignities to the successful cultivators, and even directed his own attention to the rearing of silk at the Tuileries and Fontainebleau. It was found, however, subsequently, that none of the attempts to rear the worms in the northern parts of France were permanently successful; the quantity or the quality of the silk produced (or both) being insufficient to render the attempt profitable. For the last century the only parts of France where the rearing has been carried on, are the Dauphiné and Languedoc, and even here the attempts have not proved sufficiently successful to render the attempt profitable.

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The Picturesque in Holland.—Holland, the land of cheese and butter, is, to my eye, no un Picturesque, uninteresting country. Holland is true; but it is so geometrically only, and in no other sense. Spires, church towers; bright farm-houses, their windows glancing in the sun; long rows of willow-trees—their bluish foliage rustling up white in the breeze; grassy embankments of a tender vivid green, partly hiding the meadows behind, and crowded with glittering, gaudily-painted gigs, and clattering waggons, loaded with nappy-checked, laughing women, decked out in blouses of many more colours than the rainbow, all streaming in the wind; these are the objects which strike the eye of the traveller from seaward, and form a gay front view of Holland, as he sails or steams along its coast and up its rivers. On shore the long continuity of horizontal lines of country in the background, each line rising behind the other to a distant, level, unbroken horizon, gives the impression of vastness and of novelty. Holland can boast of nothing sublime; but for picturesque foregrounds, for close, compact, snug homes, crowded with everything in harmony, and stamped with one strong peculiar character, Holland is a cabinet picture, in which nature and art join to produce one impression, one homogeneous effect. The Dutch cottage, with its glistening brick walls, white-painted wood-work and rails, and its massive roof of thatch, with the stork clapping to her young on her old established nest on the top of the gable, is admirably in place and keeping, just where it is, at the turn of the canal, shot in by a screen of willow-trees, or tall reeds, from seeing, or being seen, beyond the surrounding calm water, in which its every tint and part is brightly repeated. The peculiar character of every article of the household furniture, which the Dutch-built house-mother is stealing on the green before the door so industriously; the Dutch character is impressed on everything Dutch, and in the windows, on the faces of the Dutch or English countenances, wherever it is met with; the people, their dwellings, and all in or about them, their very movements in accordance with this style or character, and all bearing its impress strongly—make this Holland, to my eye, no dull, uninteresting land. There is a soul out and you see it. But the opinion now generally entertained is, that Holland is in the main more picturesque, though not so complete as Italy; but that with that of Italy, is so great as to render it improbable that any great commercial advantages are likely to result from the prosecution of the silk-culture in England.
THE OLD AND YOUNG COURTIER.—No. IV.

FEASTS AND ENTERTAINMENTS.

Although, as is proved by the examples given in Nos. 633 and 642, the real “good old times” lamented by the author of the ‘Old and Young Courtier’ were somewhat farther removed, and the change much less sudden, than he would lead us to believe, yet enough remained in the time of Elizabeth to give more than a mere poetical foundation for the juxta-position with which he has presented us. On the 18th of May, 1577, and the four succeeding days, the queen was entertained by the lord keeper Bacon at Gorhambury, and the charges, “warranted by a Book of Particulars,” amount to £77. 6s. 7½d., besides twenty-five bucks and two stags. The ancient plentifulness was certainly preserved, but symptoms appear of the advance of refined luxury; and while we have items of eight oxen, “in mutton sixty carcases, in veals eighteen carcases, in lambs thirty-four carcases,” to an amount of about £75, we have another of 121. “to the cooks of London for their wages”—this class no doubt had already begun to “devis[e] fine kickshaws and toys.” Elizabeth herself seems to have adhered to the old substantial mode; her own daily diet, as signed by her own hand in 1576, making no nearer approach to what are now called “made dishes” than “frants, custard, and fritter;”* her breakfast consisting of “cheate and mancheate (fine wheaten loaves and cakes), ale and beare, and wine,” of pottage made with mutton and beef, and of chines of beef, probably cold, rabbits, and butter; the dinner of two courses contained beef, mutton, veal, swan or goose, capons, rabbits, lamb or kid, herons or pheasants, cocks or godwits, chickens, pigeons, larks, eggs, and pastry, with fine wheaten bread, ale, beer, and wine; supper nearly the same as the dinner. At the queen’s own table Wednesday and Friday were kept as fasts, no flesh whatever appearing, though furnished to the other tables in her household. The dinner, in two courses, consisted of, first, “ling, pike, salmon, haddock, whittings, gurnards, tenches, birts;” second, “sturgeon, conger, carp, eels and lampreys.”

Amount to 577l. 6s. 7½d., besides twenty-five bucks and other places, there is no doubt that all novelties, native and foreign, would be presented, but they are not to be taken as specimens of the prevailing manners. Shirley, in his *Lady of Pleasure,* written about 1635, who also notices the transition, makes one of the characters say—

* Nichols’s ‘Progresses of Queen Elizabeth,’ 4to., 1823, vol. ii., p. 35. Nichols says, mistakenly, for succeeding days, she coming on Saturday, May 18, “before supper, and continuing until Wednesday after dinner following.”

† ‘Progresses of Queen Elizabeth,’ ii., p. 8, et seq.

No. 645

[“A new French Cook, to devise fine kickshaws and toys.”]
THE PENNY MAGAZINE.

154

[ APRIL 23,

The more sedate of the new king's old courtiers did | The historian tells us * .
In the year 1061 a gather
not, as far as we know , altogether give themselves up ing of marquesses, lords, knights, and squires took place
to the new extravagance. The bill of fare given on at Newcastle, to celebrate a great anniversary, when,

the visit of James I. to Houghton Tower, in Lanca- on accountof the number of guests, each was required
shire, in 1617, does not display any material advance to bring his own dish of meat. Of course it was a sort
towards fine kickshaws, but the enumeration of the of competition, in which each strove for pre -eminence ;

dishes evinces more attention to the cookery, which is
now mentioned. We have boiled ducks, burred veal
and capons, roast venison, turkeys, swans, pigs, and
mutton, with boiled “ jiggets” * of mutton and breasts
of veal ; venison pasty and mince pies hot,and roast

but the specimen of Sir George Goring was reckoned
a masterpiece. It consisted of four huge brawny pigs,
piping hot, bitted and harnessed with ropes of sausage,
all tied to a monstrous bag-pudding." In the Accom
plished Cook ,' by Robert May, published 1685, we

herons and curlew pie cold ; in each course also we have the following recipe for a herring-pie : - “ Tako
have one entry of a “ made dish :" to this list the names salt herrings, being watered : wash them between
of the chief cooks and their “ labourers” are appended . your hands, and you shall loose the fish from

the

Massinger also, in his “ City Madam ,' makes a coun- skin : take off the skin whole, and lay them in a
try gentleman plead guilty in the following manner to dish ; then have a pound ofalmond-paste ready ; mince
the charge of being unfashionable :

the herrings, and stamp them with the almond-paste,

“ I have other faults, too, very incident
To a plain gentleman ; I eat my venison
With my neighbours in the country, and present not
My pheasants, partridges, and grouse to the usurer ;
Nor ever yet paid brokage to his scrivener.
I flatter not my mercers, nor feast her
With the first cherries or peascods, to prepare me
Credit with her husband ; when I come to London ,
The wool of my sheep, or a score or two of fat oxen
In Smithfield, give me money for my expenses.

two of the milts or roes, five or six dates, some grated
manchet, sugar, sack , rose -water, and saffron ; make

the composition somewhat stiff, and fill the skins ; put
butter in the bottom of your pie, lay on the herring,
and on them dates, gooseberries, currants, barberries,
and butter ; close it up and bake it ; being baked ,
liquor it with butter, verjuice, and sugar. ” The same
author also describes how to make “ An artificial hen

made of puff paste, with her wings displayed sitting

I can make my wife a jointure of such lands too

upon eggs of the same materials, where, in each of

As are not encumber'd, no annuity
Or statute lying on them ."

pepper and ambergris."

them , was enclosed a fat nightingale seasoned with

Furnace, whoboasts
Massinger's
the cook , in of
It is, indeed , in those of our old dramatists whohave oldDebts,
himself thatNew
, Way to pay
given us pictures of the domestic manners of these

periods, that we find the truest and most vivid repre
sentations, because their satire depended for its effect
upon the known reality and comparative frequency of
the matters alluded to or related. In 1599, Jonson, in
Every Man out of his Humour,' alludes to the grow

“ I crack my brains to find out tempting sauces,
And raise fortifications in the pastry,
Such as might serve for models in the Low Countries ;

Which, if they had been practised at Breda,
Spinola might have thrown his cap at it and ne'er took it ;"

ing luxury of the “ city wives, " of whom one of his and that

characters is made to say, that though generally per
diet, diving into the fat capons, drinking your rich
wines, feeding on larks, sparrows, potato- pies, and
such good unctuous meats,” their wits are refined and
rarefied .
The gross extravagance introduced by the

fect fools, yet “ by the fineness and delicacy of their

“ with six eggs, and a strike of rye meal,

I had kept the town till domesday — perhaps longer "

may very well represent the artist at the head of our
paper, who is apparently cracking his brains, perhaps
in the composition of his “ true elixir ," in the same
play :

favourites of James gave an extraordinary impulse
to the craving after novelty and expense in enter-

Of five cocks of the game, ten dozen of sparrows,

tainments, rather than any refinement or taste in

Knuckles of veal , potatoe-roots, and marrow,

“ ' Tis the quintessence

cookery. Sir Epicure Mammon, in the ' Alchemist,'
Coral and ambergris."
inay have had more magnificence, but his imaginings The items of the composition sound strange to
were not more outré than what we find gravely re- modern ears : but potatoes were articles of luxury for
corded. The dramatist says
a considerable time after their first introduction into
“ My meat shall all come in, in Indian shells,
England ; ambergris was commonly used in giving
Dishes of agate set in gold, and studded
With emeralds, sapphires, hyacinths, and rubies.
The tongues of carp3, dormice, and camels' heels,
Boil'd in the spirit of sol, and dissolved pearl,

Apicius' diet against the epilepsy ;
And I will eatthese broths with spoons of amber,
Headed with diamond and carbuncle.

My foot-boy shall eat pheasants, calver'd salmons,
lampreys; I myself will have
godwits,barbels
Kuots,
beards
served instead
sallads

The

of

of

;

Oil'd mushrooms ; and the swelling unctuous paps

Of a fat pregnant sow, newly cut off,
Drest with an exquisite and poignant sauce ;
For which I'll say unto my cook, There's gold ,
Go forth , and be a knight."
And again“ We will eat our mullets,
Sous'd in high country wines, sup pheasants' eggs,

flavour to dishes; and coral was possibly used as an
ornament. In his City Madam , Massinger again
marks the extension of this tasteless extravagance :
“ Men may talk of country, Christmasses, and court gluttony,
Their thirty pound butter'd eggs, their pies of carps' tongues
Their pheasants drench'd with ambergris, the carcases
of three fat wethers bruised for gravy , to

Make sauce for a single peacock ; yet their feasts
Were fasts, compared with the city's."

Among the items of this city feast - of which
“ Three such dinners more would break an alderman ,
And make him give up his cloak "
are enumerated

“ Three sucking -pigs served up in a dili,
Ta'en from the sow as soon as farrowed ,

And have our cockles boil'd in silver shells ;

A fortnight fed with dates and muscadine,

Our slırimps to swim again , as when they liv'il,
In a rare butter made of dolphins' milli,

That stood my master in twenty marks a piece,
Besides the puddings in their bellies, made

Whose cream does look like opals; and with these
Delicate meats set ourselves high for pleasure."

Of I know not what. I dare swear the cook that dren'ali!
Was the devil disguised
like a Dutchman . "
等

* The French gigot. The word is still commonly used in
Scotland for the shoulder of mutton ,

*



The human mind, stimulated by rapidly increasing noises, is not of opinion that the taverns were beyond gross sensuality and profligate extravagance. The taverns and streets were scenes of the most scandalous debauchery and riot; nor was any place sacred from the outbreaks of intemperance and passion.

In the reign of Elizabeth female education in the upper ranks was often too pedantic or too householdly, or both. In the restrained licence which succeeded, no care seems to have been taken to substitute anything better; and as women necessarily associated with the men, they gradually assimilated themselves to their manners. The more decorous court of Charles I., and the doctrines and practice of the Puritans, completely restored the purity and decency of our women, which not even the vile examples of the time of Charles II. could affect beyond the atmosphere of his court, and which has continued to brighten and improve from that period to this.

Tram-roads in Ancient Greece.—It is generally supposed that the Greeks, amid all their advance in abstract science, were comparatively backward in some of the most important arts of civilised life, more especially in all that relates to interior communication by means of roads, bridges, &c. There are, however, many strong evidences, both of a practical and speculative nature, that under all these disadvantages this branch of interior economy was, according to the use and fashion of the Greeks, amid all their advance in abstract science, brought to a high degree of perfection in Greece than has usually been supposed. Travellers have long been in the habit of remarking the frequent occurrence of wheel-roads in every part of that country, often in the remotest and least frequented mountain-passes, where a horse or mule can now with difficulty find a track. The term rut must not here be understood in the sense of a hole or inequality worn by long use and neglect in a level road, but of a groove or channel purposely scooped out at distances adapted to the ordinary span of a carriage, for the purpose of steadying and directing the course of the wheels, and lightening the weight of the draught, on rocky or precipitous ground, in the same manner as the sockets of our railroads.

The Penny Magazine. 155

"If you'll honour us, The Bear at the bridge-foot shall entertain you. A drawer is my Ganymerge; he shall shirk Nectar to us: we will only have A dozen partridges in a dish; as many pheasants, Quails, cocks, and godwits shall come marching up Like the train'd band; a sort of sturgeon Shall give most bold defiance to an army, And triumph o'er the table."

The lady quietly excuses herself, but adds, "another time I may be your guest," to which it is replied—

"Tis grown in fashion now with ladies; When you please, I'll attend you."

In his embassy to France, in 1619, he is said to have ridden into Paris on a horse shod with silver, the shoes being talked on to pass as new, and if they fell off occasionally, while a farrier followed behind with others to replace them.

"To every vulgar censure; this at midnight, After a drunken supper at a tavern (No civil man abroad to censure you), Had shown poor in you;

but this is only the opinion of a peaceful merchant. Then, as now, class opinions would outweigh, in the minds of thoughtless and extravagant young men, those of the more numerous but quiet and unobtrusive masses; the applause of their associates was far more effectual than the expostulations of their seniors, the exhortations of the preachers, or even the satire of the poets. Now, indeed, public opinion is grown much too strong to be contemned, and frolics must not extend to anything positively disgraceful, and the public peace is too well guarded to admit of crime being perpetrated without detection and punishment. But at the time of which we write, Shirley, in 'The Gamester,' describes—

"The dishes were raised one upon another, As woodmongers do billets, for the first, The second, and third course; and most of the shops Of the best confectioners in London ransack'd To furnish out a banquet; yet my lady Called one purious rascal, and cried out, There was nothing worth the eating."

We are almost of opinion that the lady was right. The more decorous court of Charles I., and the doctrines and practice of the Puritans, completely restored the purity and decency of our women, which not even the vile examples of the time of Charles II. could affect beyond the atmosphere of his court, and which has continued to brighten and improve from that period to this.

"The plates that roar In brothels, and break windows: fright the streets At midnight worse than constables, and sometimes Set upon innocent bellmen, to beget Discourse for a week's diet: that swear damm'd me's With pistol, poniard, rapier, and batoon, As they would murder all the king's liege people, And blow down streets."

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HERNE'S OAK.

The above is a copy of a drawing, now first engraved, made by the Rev. Dr. Spry, when an Eton boy, in 1790. The fine old tree which forms its subject was then generally called Herne's Oak, and was subsequently cut down.

In Mr. Knight's editions of Shakspere will be found a wood-cut of the reverse side of the same tree, from a drawing made in the year 1800, by Mr. W. Delamotte, the Professor of Landscape Drawing to the Royal Military College, Sandhurst, whose sketches and etchings of trees are amongst the most beautiful productions of English art. Mr. Delamotte was a pupil of the late venerable Benjamin West, President of the Royal Academy, under whose care he was placed in 1792. Mr. Delamotte has often heard his master lament that Herne's Oak had been cut down, to the great annoyance, as Mr. West stated, of the king and the royal family. According to Mr. West's account of the circumstance, the king had directed all the trees in the park to be numbered; and upon the representation of the bailiff, whose name was Robinson, that certain trees encumbered the ground, directions were given to fell those trees, and Herne's Oak was amongst the condemned. Mr. West, who was residing at Windsor at the time, traced this oak to the spot where it was conveyed, and obtained a large piece of one of its knotty arms, which Mr. Delamotte has often seen. Mr. Ralph West, however, the eldest son of the President, who as a youth was distinguished for his love of art and his great skill as a draftsman, made a drawing of this tree before it was felled, and Mr. Delamotte's drawing was a copy of this sketch.

In the editions of Shakspere above referred to will be found other versions of the belief that the tree known by tradition as Herne's Oak no longer existed. One relation is, that George III. had told Lady Ely that Herne's Oak was cut down, amongst a number of what were called unsightly trees, when he was a very young man. Another version of the popular belief is, that the tree was blown down some sixty years ago; and this is given in Mr. Knight's 'Library Edition,' in an extract of an account furnished by the son of an old resident at Windsor, who is still alive:—"My father states that about sixty-four years since there was a deep chalk-pit sunk inside the park at Windsor, nearly opposite the Hope Inn (which is now nearly filled up again, and through which the road to Datchet now runs). The chalk was taken in immense quantities from this pit to fill up the ditch which then ran round the Castle, it being considered it would render the foundation of the Castle and connected buildings more secure, as in many places they were giving way. The removal of the chalk from this pit for this purpose in some measure undermined a fine oak tree, which stood on the upper side of the pit nearest the Castle. Shortly after a storm came and blew this tree down,
and this circumstance created a great sensation at the
time, as that tree was considered to be the identical
Herne’s Oak of Shakspere notoriety. My father had
in his boyish days very frequently played in the pit and
round the tree; and its locality is therefore strongly
impressed on his memory, although now between sixty
and seventy years since. Mr. Emlyn was architect and
superintendent of the works at the Castle at that time:
—He had the fallen tree removed to his yard, where it
was cut up.” Our informant adds, that a piece of the
oak was made into the stock of a gun, and given to a
person “ who, not being aware of its value as a relic, 
sold the gun some years since to a farmer to scare crows
with.” The letter then concludes thus: “ My father
wishes me to add, that it must not be inferred that there
was no pit existing previous to the removal of the chalk
for the purpose stated. There was before then such a
pit as described in Act V., Scene 3, where Mrs. Page
says,—

“They are all couched in a pit hard by Herne’s oak.”

In Mr. Jesse’s second series of ‘Gleanings in Natural
History,’ published in 1834, it was mentioned that the
real Herne’s Oak was still existing; that it was “ close to
an avenue of elms,” near the footpath leading from
Windsor to Datchet; that it was not cut down, as some
people had affirmed. In 1836 the following passage
appeared in the Quarterly Review:

“Among his anecdotes of celebrated English oaks,
we were surprised to find Mr. Loudon adopting (at
least, so we understand him) an apocryphal story about
Herne’s Oak, given in the lively pages of Mr. Jesse’s
‘Gleanings.’ That gentleman, if he had taken any
trouble, might have ascertained that the tree in ques-
tion was cut down one morning, by order of King
George III., when in a state of great, but transient,
excitement: the circumstance caused much regret and
astonishment at the time, and was commented on in the
newspapers. The oak which Mr. Jesse would decorate
with Shaksperian honours stands at a considerable
distance from the real Simon Pure. Every old woman
in Windsor knows all about the facts.”

Mr. Jesse replied to this statement of the Quarterly
Review,” in a letter addressed to the Editor of the
Times. From this time the existence or non-existence
of Herne’s Oak has been a subject of controversy.
The arguments on either side are given in Mr. Knight’s
‘Shaksper,’ from which we copy the following de-
tails:—

“The memory of the editor carries him back to
Windsor as it was forty years ago. The Castle was
then almost uninhabited. The king and his family
lived in an ugly barracks-looking building called the
Queen’s Lodge, which stood opposite the south front
of the Castle. The great quadrangle, the terrace, and
every part of the Home Park, was a free playground
for the boys of Windsor. The path to Datchet passed
immediately under the south terrace, direct from west
to east, and it abruptly descended into the Lower Park
at a place called Dodd’s Hill. From this path several
diverged in a south-easterly direction towards the
dairy at Frogmore; and one of these went close
by a little dell, in which long rank grass and fern
and low thorns grew in profusion. Near this dell
stood several venerable oaks. Our earliest recollec-
tions associate this place with birds’-nests and mush-
rooms; but some five or six years later we came to look here for the 'oak with great ragged horns,' to which we had been introduced in the newly discovered world of Shakspere. There was an oak, whose upper branches were much decayed, standing some thirty or forty yards from the deep side of the dell; and there was another oak, with fewer branches, whose top was also bare, standing in the line of the avenue near the park wall. We have heard each of these oaks called Herne's Oak; but the application of the name to the oak in the avenue is certainly more recent. That tree, as we first recollect it, had not its trunk bare. Its dimensions were comparatively small, and it seemed to have no pretensions to the base to which it occasionally received. The old people, however, used to say that Herne's Oak was cut down or blown down, and certainly our own impressions were that Herne's Oak was gone. One thing, however, consoled us. The little dell was assuredly the 'pit hard by Herne's Oak' in which Anne Page and her troop of fairies 'couched with obscured lights,' and so we for ever associated this dell with Shakspeare.

With our own recollections of the localities still vivid, we have recently visited the favourite haunts of our boyhood in the Little Park. Our sensations were not pleasing. The spot is so changed, that we could scarcely recognise it. We lamented twenty-five years of its silent existence. The footpath to Datchet has been carried through the picturesque dell, near which all tradition agreed that Herne's Oak stood; but we were not prepared to find that, during the alterations of the Castle, the most extensive and deepest part of the dell, all on the north of the path, had been filled up and made perfectly level. Our old favourite dell, all the ancient and the antiquated trees that stood in and about the dell are covered up. Surely the rubbish of the Castle might have been conveyed to a less interesting place of deposit. The smaller and shallower part of the dell, that on the south of the path, has been half filled up, and what remains is of a formal and artificial character. Mr. Jesse seems quite unaware of the change that has taken place in the locality, for in his 'Gleanings' he says, 'I was glad to find a pit hard by, where Nan and her troop of fairies, and the Welsh devil Evans, might all have crouched, without being perceived by the 'fat Windsor stag' when he spake like Herne the hunter. The pit above alluded to has recently had a footpath made through it; and the circumstances being near the oak, with the diversion of the footpath, seem to prove the identity of the tree, in addition to the traditions respecting it.' The divergence of the avenue, which Mr. Jesse, somewhat enthusiastically, attributes to the respect of William III. for Herne's Oak, must, we fear, be assigned to less poetical motives. The avenue, we understand, formed the original boundary of the park in that direction. It diverges a hundred and twenty yards before it reaches Mr. Jesse's Herne's Oak; and there is little doubt that the meadow on the south of the avenue after it diverges, which in our remembrance was a separate enclosure, was formerly a common field. The oak which Mr. Jesse calls Herne's, is now perfectly bare down to the very roots. "In this state," says Mr. Jesse, "it has been, probably, long before the recollection of the oldest person living." He adds, "it has always been protected by a strong fence round it." In our own recollection this tree was unprotected by any fence, and its upper part only was withered and without bark. So far from Herne the hunter having blasted it, it appears to have suffered a premature decay within the last twenty years. This tree is of small girth compared with other trees about it. It is not more than fifteen feet in circumference at the largest part, while there is a magnificent oak at about two hundred yards distance whose girth is nearly thirty feet.

The doubts which naturally belong to this question are, we apprehend, sufficiently cogent to render it a somewhat bold act for the authorities connected with the park to have recently put up a board on Mr. Jesse's favourite tree in the avenue, bearing this inscription: —

"There is an old tale goes that Herne the hunter, Sometime a keeper here in Windsor forest, Doth all the winter-time, at full midnight, Walk round about this oak." *

The subject has been recently investigated with great acuteness by Dr. Bromet; and his conclusions are given in a very interesting letter in the 'Gentleman's Magazine' for April, 1841. He has collected a variety of testimony from living persons, which goes to prove that a tree called Herne's Oak was cut down some sixty years ago, and that the tree which now pretends to the honour—"this oak"—had acquired the name in very modern times:—"its present name was not conferred upon it until some time after the demolition of another old tree formerly possessing that title." This entirely agrees with our own personal recollections of the talk of Windsor about Herne's oak. But Dr. Bromet also observes that the present day's claims of Mr. Jesse's oak is "Collier's map of 1742, which actually points out 'Sir John Falstaff's oak' as being not in the present avenue, but outside it, near the edge of the pit." Mr. Collier was 'a resident in the immediate vicinity of the tree he thus distinguishes;' — and his map is therefore an indisputable record of the reality and character of the tree in primitive times or in the early periods of such names as still exist. We have given in the preceding page a faithful representation of the oak in the avenue of elms, which is declared to be Herne's Oak in the above passage from Shakspeare with variations.

CEMENTS AND ARTIFICIAL STONE.

In the earlier ages of society it is probable that those compositions which we now term cements were not known. The purpose to which such materials are now applied is either to cause masses of stone or brick to adhere one to another, or else to form a substitute for stone, and neither of these was required in the primitive times or in the early periods of such names as still exist. Huts were built of trunks of trees, twigs, and other materials which the forest could furnish; the erection of stone buildings forming a more advanced stage in the progress of civilization.

The construction of more permanent buildings would depend a good deal on the geological character of the country, a rocky or stony surface offering materials different from those of an alluvial soil would afford. But when small masses of stone or bricks became used in buildings, the use of some kind of cement was necessary, since the masses were not ponderous enough to retain their positions without some other agency. Consequently we find different substances employed for this purpose, of which the two principal, in this country, have been lime and in, one or other of their various forms. Nebraska the Romans were cemented with mortar made of lime. Thatenterprising people also formed some of their public roads

* Shakspere wrote "still midnight," and "an oak."
By laying a foundation of rough stones and cementing them together with liquid mortar, which hardened into a hard matter. In all the various countries of Europe, whereinto the custom of laying such foundations was gradually introduced, a cement or mortar made principally of lime has been almost universally employed.

It is curious that this substance, valuable as it is, does not form a durable cement by itself, nor does it occur naturally in the form which fits it for use. Limestone occurs abundantly in the mineral kingdom, being used. He states that the building, in which this mortar was used were more durable than others, in which the mortar had been made from lime not so treated; and also that certain buildings had failed because the mortar employed in their construction contained too large a proportion of sand.

The number of water-cements and kinds of artificial stone proposed at various times is considerable, both in relation to the number of ingredients and the proportions between them. The substance employed by the Romans as a cement for moles and other structures exposed to the action of the sea, consisted of three parts of pizzolana mixed with one of lime. British engineers have used a great variety of such cements, containing frequently of mixtures of lime and sand, but sometimes of other substances. Smeaton employed a cement made by the construction of the Eddystone Lighthouse a cement formed of equal parts of powdered Aberlame lime and powdered pizzolana; the mortar made from these ingredients was well beaten before being used, a process which seems to increase the tenacity of the cement.

If slaked lime be mixed with water, it will form a paste or cement, but of so weak a nature, that a shower of rain will wash it away. Sand, or some other hard pounded substance, is therefore added to give firmness. Common London mortar consists of one part white chalk-lime to two and a half of clean sharp river-sand; but if the lime has been imperfectly burned, or if the sand be dirty (both of which circumstances are frequent), the mortar adheres imperfectly to the bricks. The Romans had an intimate acquaintance with the nature of mortar cements; for Pliny relates that there was a law among them to the effect that after the ingredients of mortar had been rubbed together with a little water, they should remain in a covered pit for three years before being used. He states that the building, in which this mortar was used were more durable than others, in which the mortar had been made from lime not so treated; and also that certain buildings had failed because the mortar employed in their construction contained too large a proportion of sand.

The cement known as Roman cement has, like most others, a large portion of lime as its principal ingredient. In an analysis of this cement by Berthier, he found that its constituents differ so little from the constituents of chalk and common clay, that he proposed the manufacturing of a similar cement by the mere mixture of these two ingredients in certain proportions. One part of clay and two and a half parts of chalk harden very quickly into a cement.

Within the last few years many schemes have been set on foot, and many patents procured, for the manufacturing of cements and artificial stone from various ingredients. In some cases the object is to form a mortar, with which stones or bricks may be bound together; in others, a water-cement for lining walls and other structures exposed to the action of water; in others, to form a pavement, terrace, or floor.
THE THAMES PIKE.

In a recent number we gave an account of the Pike, with an engraving. We have now the pleasure of subjoining some observations on the habits of the Thames Pike, furnished us by a correspondent, whose success as an angler is equalled upon the long, and with which he assumes a much higher character than a mere diversion, because it is associated with that keen habit of observation which can alone make a real naturalist.

The months of March and April do not afford any sport to legitimate anglers, none of the river fish being in season; and although modern sportsmen fancy that Thames trout are fit to be taken in April, yet anglers of the old school would as soon take one this month, as a good shot would kill a partridge on the first of August. The Thames pike have now just finished spawning; so in giving some short account of this fish we shall preface the subject by recommending all lovers of angling who aspire to become genuine disciples of the good old Izaak, to make themselves acquainted with the haunts and habits of fish, and they will find few so interesting as those of the pike. The habit of these fish in spawning-time is exactly the same as that of the salmon; for as the latter range along the sea-coast to find the mouths of the rivers, and leave the sea-water to spawn in the fresh streams, so the pike also seek out the borders and tail of the month of March, and range along the banks and shores of the river to find the entrances to the spring ditches, and they perform all the feats of the salmon on a small scale in leaping over sluices, getting up shoals where the water will scarcely cover them, and in surmounting every difficulty till they reach the spring water. When there, they trace it to its source, and there, among the cleanest and greenest weed, the spawn of the female is deposited, which is afterwards impregnated with that of the male. As soon as this is accomplished, the pike rapidly retrace their way back to the river, and retire to the quiet nooks, eddies, and rush-beds, generally taking up their abode in the weed at the bottom of the deeps of these places, feeding about every six hours. Wherever the pike first takes up his quarters when he has regained the river, he may be found till the beginning of October, and although the angler generally commences his sport in July, by trolling with the gorge-hook at the tails of weeds, and among the dock-leaves and water-lilies bordering on the high eddies below, he may much better wait till October, and as soon as the upper weed begins to shift he will find most glorious sport in spinning (with large trout-tackle tied on fine gimp) over the short green streamy weed, and the clean pickerel-weed, known only to anglers of long standing, or in the deep slughish eddies where the dock-weed has just begun to purify itself; two other favourite haunts are the borders and tails of rush-beds, when the ribbon-weed has sufficiently rotte, and let the streamy weed sink down over the rushes. In the months of November and December the pike take the eddies, and the angler, if he is not afraid of a north-wester, will find beautiful sport (always supposing the floods have not commenced) trolling down the borders of the streamy eddies; and a pike caught at this season will well repay his toils for if his cook understands his business, there is no better fish comes to table.

The fecundity of the pike is beyond all calculation, and if some legislative enactment were made for its protection when it leaves the river, the Thames would be abundantly stocked with them without doing much mischief to the trout, the range of water being too wide for the pike to do much execution among them. The necessity of this pike is now seen by the following short narrative given by an angler:—

I had been watching at the mouth of a spring ditch running into the river in the neighbourhood of Windsor, in the month of March, where the water falls over a sluice of about two feet and a half; and having seen several fish leap over the fall, I walked up the bank of the spring ditch, and set down a fish with a wiry pole about ten feet long, at the small end of which was fastened a wire snare; he informed me he had just missed a fish of about five pounds weight: the water was as clear as crystal, the bottom being covered with patches of green winter-weed interspersed with roots of the water-lily, which had just begun to spring. After searching about for a few minutes, he gave in despair, 'Here he is!' Having a good eye for the water, I was mortified at not immediately seeing him; after a few seconds, however, I observed the smallest possible portion of his tail-fins as it protruded beyond the end of a patch of green weed, the rest of the fish being completely imbedded in it. In an instant the weed was gently parted with the wire, and the fish was then most interestingly examined. Jack-Ketch sort of style, passed over his head, and the next moment the fish was kicking on the bank. My friend of the snare again adjusted the wire, and informed me he should have the other in a minute. I asked 'Which other?' He said, with a knowing wink, 'Why, the male, to be sure; don't you see this is the female?' And sure enough, about fifteen yards above the fish just found another fish, of about the same weight, partly hidden under the young leaves of some water-lilies. He was, however, rather too confident, for the fish started, and was not to be found again, at least on that day. I saw this worthy up his quarters, when he had done with the fish; he informed me he had sold it to a fishmonger at Windsor. I learnt afterwards that the fishmonger having exposed the fish for sale in his window, it had attracted the attention of a celebrated angler and natural historian, who purchased it of the fishmonger, and sent it as a present to a scientific friend in London. And so, thought I, things go on as usual; but if parliament would only take it into its head (as nineteen out of twenty of the pike tribe are thus destroyed in the ditches in the spawning-time) to give every rascal caught with a snare anywhere in the vicinity of a spring ditch in the month of March a twelvemonth's imprisonment, and fine every common person convicted of buying a pike after the middle of February 54., and every philosopher, if guilty of the same offence. Thus, there would be some chance of preserving the Thames Pike.
LOCAL MEMORIES OF GREAT MEN.

Nicholas Poussin.

The local memories of an artist who, like Poussin, rose to eminence against every adverse fortune,—whose gentle manners and innocent life were untroubled by the sneers of envy, and un seduced by the allurements of licentiousness, present features of unusual interest to the admirers of painting. By the term admirers, we do not mean those who only value the art of painting for the pleasure it may afford to the eye, but those who, in the spirit of this great artist, believe that it conduces to the virtue, and, of consequence, to the happiness of mankind. "To the young artist," says Maria Graham, "the life of Poussin is a beacon to guide him through every difficulty: an encouragement beyond that which any patronage can afford; for it proves that, in despite of outward circumstances, genius, aided by industry, will be its own protector, and that fame, though she may come late, will never ultimately refuse her favours to real merit." The cause of his success appears to have been, that Poussin considered whatever was worth doing at all was worth doing well; and that he verified his own emphatic words, replying, when asked late in life by Vigneul de Marville how he gained so high a reputation amongst the great painters of Italy, "I have neglected nothing." Every science that he could study consistently with the practical part of his art attracted his attention and shared his ardour; and in
his favourite pursuit he considered that extensive-ness of surface was by no means indispensable to
grandeur of design. Hence all his works exhibit the
results of profound thought, diligent study, and accu-
rate observation, and, with but very moderate sums
executed on a moderate scale. We find none of
his pictures reminding us of the whimsical, but happy
description of Peter Pindar, where he satirizes the

"Acres of canvas paved with paint."

The general objection made to his compositions is
that they partake too much of the forms and attitudes
of the sculpture of antiquity, an objection that is well
founded. Indeed, in one of his pictures, that of 'The
Israelites gathering Manna,' he has even ventured to
adapt to his subject the figures of the Laocoon, the
Niobe, the Seneca, the Antinous, the Wrestlers, the
Diana, the Apollo, and the Venus de' Medici.

The family of Poussin was noble, but poor. His
father, Jean Poussin, was a native of Soissons, and
served with credit in the regiment of Tavanes during
the reigns of Charles IX., Henry III., and Henry IV.;
but the poverty of the royal coffers, during that un-
happy period, had thrown all the expenses of a military
life upon himself, and, like many of his brave fellow-
soldiers, he was reduced to the greatest indigence.
After his marriage, he removed to Andelys, where he
resided, married Marie de Laisement, the widow of
Le Moine, a lawyer of that place; and having
quitted the military service, he retired to Andelys in
Normandy, some time in the year 1592, where, in June,
1594, his son Nicholas was born. The earliest indica-
tions of a taste for art displayed themselves in Poussin
when young, and, with Paterck, who was contemporary
with him, says, in 'The Lives of Painters, Sculptors,
and Architects,' that his schoolmaster used frequently
to chide him for making designs on the margins of his
books, instead of attending to his regular studies. The
beauty of the scenery round Andelys, situated as it is
amidst the hills on the right bank of the Seine, and
including in its neighbourhood all the subjects
represented in the engraving, doubtless fostered the
taste of Poussin for landscape composition, a taste
which was so strong as not to be overcome even when the
subject of his pencil was historical com-
position. Of this prevailing fancy Fuseli complains,
for he says, "The excellence of Poussin in landscape
is such as to prevent investigation of the object of his
picture precludes all censure; but con-
sidered as the scene or background of an historical
subject, the care with which he executed it, the predi-
ction which he had for it, often made him give it an
importance which it ought not to have: it divides our
attention, and, from an accessory, becomes a principal
part." The sketches which he made amidst this
delightful scenery attracted the attention of Quentin
Varin, a native of Amiens, who then resided in
Andelys, and who taught him the rudiments of his art.

It was with difficulty that Jean Poussin could be
persuaded to allow his son to adopt painting as a
profession; but having consented, Nicholas soon found
that the instructions of Varin were insufficient, and, at
the age of eighteen, friendless and nearly moneyless,
he went to Paris, and studied successively under Fer-
dinand Elle, of Malines, a portrait painter, and L'Alle-
man, a painter of history, who was deficient, however,
in all but the mechanical part of his art, and with whom
Nicholas remained only a few months. When with
the latter, the author says he "contracted a friendship
with Philippe de Champagne, which was afterwards of singular advantage to him;" but M. Gene, in the Biographie Universelle, says that this is a mistake, for that Philippe de Champagne
did not go to Paris till 1621. A young nobleman of
Poitou became a generous friend to Poussin, and fur-
nished him with money to enable him to pursue his
studies; and after the young painter had diligently
coympy many drawings of Raphaelle and Givino Romano,
the master, was invited to the collection of M. Courtois,
and took a great delight in the work. The sculptor,
himself in his art, invited him to Poitou, with the view
of further patronage and liberal employment. The
want of taste, however, of this nobleman's mother did
not permit her to value the artist's ability, and he was
invited to the light of a domestic drudge, and accord-
ingly he withdrew in disgust, and set out on foot on his
return to Paris. In this manner he became the noblest
painter of our times. Without the judicious care of
his pencil, accepting any employment and at what-
ever remuneration he could obtain; the former being
so severe, and the latter so scanty, that on arriving at
the capital he was attacked by a dangerous sickness,
bring on, it is supposed, by extreme labour and a
scanty sustenance. He returned to Andelys, where he
remained with his family a year, occupying himself in
painting both in distemper and oil, for such prices as
he could obtain. On his recovery he again proceeded
to Paris, and became acquainted with the Cavaliere
Marino, the Italian poet, with whom he lived on terms
of the closest intimacy, and by whom he was invited
to Rome, whither he removed in 1624. As a resident
in the Eternal City, he chose the chair of the chief
painter of the Latin world, and was induced to
believe that he should there live in tranquillity, but his friend soon after dying, and the Cardinal
Barberini, to whose notice Marino had introduced him,
being sent on an embassy to France and Spain, he
found himself in a foreign city, destitute of patrons,
and without any means of living, excepting what his
pencil might afford. Still undaunted, he pursued his
art with fervour, selling some of his noblest works for
sums barely sufficient to pay for the materials on
which they were painted, until the return of the Cardinal
of Rome extricated him from his difficulties. For that
dignitary he painted his celebrated picture of the
'Death of Germanicus,' and the 'Taking of Jerusale-
mem,' which were formerly in the Orleans collection, and
now among the most valued of the pictures belonging
to Lord Francis Egerton. They were bought by
the late Duke of Bridgewater for 4900 guineas.

Of the remaining history of this great painter, it
will be sufficient in this place to say, that in 1633 he
was induced to return to Paris, where he was ap-
pointed principal painter to Louis XIII., and had
many commissions to execute important works. The
envy of contemporary artists disgusted him; and in
three years, under the pretence of fetching home his
wife, and settling various affairs in Italy, he withdrew
from France, and finally settled at Rome, where he
was the object of painting and embellishment that he may hence-
forward order for the decoration of his royal houses;
ordering also, that none of his other painters shall
execute any of their works for his majesty without
having first submitted their designs to the said Sicur
Poussin, and received his directions and advice there-
and we are not less impressed with the beauty and
and are seemingly to contemplate the rivers and the
and grandeur of the scenery he displays in his landscapes,
and with the dignified characteristics that distinguish
his historical works."

In the last letter this eminent man ever penned he
thus expresses himself concerning that part of his art
which consists of "things which are not to be learned,
and which make an essential part of painting. First,
the subject must be noble. It should have received
no quality from the mere workman; and to allow
scope to the painter to display his powers he should
select that most capable of receiving beautiful form.
He must begin by composition, then ornament, pro-
priety, beauty, grace, vivacity, costume, probability,
and judgment in each and all. These last belong
solely to the painter, and cannot be taught. They are
the golden bough of Virgil, which no man can find or
gather, if his fate do not lead him to it. These nine
parts deserve, on several accounts, to be treated by
some good and learned author."

We may close this paper by a short description of the person of Poussin
which distinguished him; and which may be added that of Lanzi, who observes,—
"I do not mean to exaggerate, when I say that the
Caracci improved the art of landscape painting, and
Poussin brought it to perfection."

With regard to the imitation of the antique in his
figures, Reynolds has really done much to shew that it arose from
similarity of thought than plagiarism of form. He
says, "Poussin lived and conversed with the
ancient statues so long, that he may be said to have
been better acquainted with them than with the people
about him. I have often thought that he carried his
veneration for them so far, as to wish to give his
works the air of ancient paintings. . . . No works of art
have so much the air of the portico paintings of
those as those of Poussin. His best performances have a
remarkable dryness of manner, which, though by no
means to be recommended for imitation, yet seems
perfectly correspondent to that ancient simplicity
which distinguishes his style. Like Polidoro, he
studied the ancients so much, that he acquired a habit
of thinking in their way, and seemed to know perfectly
the actions and gestures they would use on every
occasion."

Fuseli, on the other hand, charges him
with plagiarism, a charge fully borne out by the
picture before referred to, "The Israelites gathering
Manna." That learned and acute critic observes,—
"Though Poussin abstracted the theory of his propor-
tions from the antique, he is justly formed in his
style of design: ideal only in parts, and oftener
so in female than in male characters, he supplies,
like Pietro Testa, antique heads and torsos with
limbs and extremities transcribed from the model."

That he was devotedly attached to the forms of the antique is obvious, and in a letter to M. de Chantelou,
he declares his wish and application to form the
which the Greeks had introduced into their music; the
Dorian for the grave and serious, the Phrygian for the
veheement and passionate, the Lydian for the soft
and tender, and the Ionian for the riotous festivity of
his bacchanals. Still he did not neglect the advantages
to be derived from the study of the excellences of
the moderns. He crossed a little Roman empire,
and his look is altogether dignified yet modest.
Indeed it has been considered, and with great justice,
that he can be hardly said to be inferior to that sublime
painter in the purity and majesty of his conceptions,
the select beauty of his forms, the grace and dignity of
his attitudes, and his just and animated expression of
the passions. His compositions, the result of a refined
and profound meditation, are simple, grand, and judi-
cious; and it will not be denied that his works are dis-
tinguished by a refined and classical observance of the
propriety of costume.

To his colouring many objections have been taken,
and it must be admitted that in his historical com-
positions the prevalence of the russet tint and the
unbroken red are far from being harmonious or rich.
De Piles, indeed, goes so far as to say that he is cold
and feebly as a colourist, but to this sweeping censure
Mr. Bryant makes the following reply:—"It did not
occurs to that critic, that brilliancy of tints and splen-
dour of colour would ill accord with the solidity and
sublimity which is intended to complete the union
that the sublime and majestic would be degraded by a
union with the florid and the gay. The elevation of
his mind is conspicuous in everything he undertook;
covered that England owed the superiority of her marine to the arsenals which she possessed in the Channel." The great Vauban was sent to examine the northern coast of France, to see whether any arsenal and port could be there constructed. He reported "that the roadstead of Cherbourg possessed, for the means of attack, of defence, and of protection; that it was very capable of exerting an influence in maritime war, and in their commercial relations with Northern powers; that it was the spot on which the head-quarters should be established on the coast of the Channel; and that it was a good central advanced post towards England.

The site, on referring to a map of France, that Cherbourg is situated on that part of the French coast nearly due south of the Isle of Wight; and that although there is at this spot an inlet of the seas, it is yet completely exposed to winds and waves from the north. Any arrangements therefore for making Cherbourg a port of attack and defence required that something in the nature of a breakwater should be constructed, to stem the violence of the waves, and to form a harbour for the shipping. During the earlier half of the last century many plans were proposed for carrying out this object. One was, to build a fort on each of the points of land which bound the roadstead, and to construct another fort in the midst of the sea, where between them, which should serve both as a breakwater and as a garrisoned fort. Another plan was, to construct, at the distance of a league in the sea, a stone dike of two thousand toises in length, leaving three open passages into the roadstead, one at each end and one in the middle. This dike was to have as its nucleus a number of old and worn-out ships: these were to be floated out to their proper situations, filled with stones till they sunk, and then covered on all sides by masonry.

At length a plan was proposed which ultimately received the sanction of the government. It was a modification and improvement of the plan just spoken of, but, as experience has shown, was bad in principle. It was, to place nearly one hundred isolated structures in the sea, extending in a line across the roadstead or harbour of Cherbourg, and forming a barrier which, though not continuous, was deemed sufficient to stem the power of the waves. The structures were to be immense truncated cones of wood, sunk to the bottom of the sea, then filled to the top with stones, and lastly surmounted by masonry, on which small garrisons might be placed.

It was considered necessary in the first place to make an experimental trial as to the possibility of constructing and sinking the immense cones which would be required. For this purpose a cone of timber was constructed, thirty-six feet high, a hundred feet in diameter at the top, and a hundred and fifty at bottom, closed in all round, but open at top and bottom. In order that this should float to the spot where it was to be sunk, a number of air-casks were attached to it; a moving-power was then applied, the position was adjusted, the air-casks removed, and the immense machine sunk into the waves.

The experimental trial being deemed satisfactory, arrangements were made for commencing operations at Cherbourg. It was at first proposed to have ninety cones to form the breakwater; but the number was afterwards reduced to sixty-four,—a far higher number, however, than were destined to be built. The cones were to be a hundred and fifty feet diameter at the base, sixty feet diameter at the top, and from sixty to seventy feet in height, the top being a little above the highest tide-level. The interval between the upper part of every two adjacent cones was about seventy feet across, and was proposed to be closed by a chain, when...

ever it was deemed desirable to keep out foreign ships. Operations were commenced in the year 1784, under the direction of M. Cessart, the engineer who had proposed the plan. More than fifteen hundred artificers and workmen were employed in the work, besides a numerous bodyguard possessed of the castle, and eighty small vessels were employed to carry out stones to fill the cones. By the month of July, 1784, two cones had been constructed, floated out, and sunk; but before the second one could be filled with stones, a storm arose and destroyed a great part of the cone. In the following year, three more cones were sunk; in 1786, five; in 1787, five more. In the year 1788, three more cones were sunk, which proved to be the last, although little more than one quarter of the proposed number. The truth was, that the Government, sufficiently embarrassed by the political and financial difficulties of that period, became wearied with the slow progress and great cost of the breakwater. The operations were suspended, after the expenditure of about thirteen hundred thousand pounds in six years, and the sinking of about five million tons of stone in and around the eighteen cones.

Of the cones themselves, which cost one-third of the entire outlay, and which were expected to brave storms and tempests, one lasted fourteen years, one five years, six four years, and all the other ten went to pieces the year 1809, having been out of service, although the Government, sufficiently embarrassed by the political and financial difficulties of that period, had yielded to the pressure of necessity and continued the work.

Two or three years after the cessation of the operations it was proposed to case over the surface of the dike, as it then stood, with large blocks of stone; and to carry the height of the dike, along its whole extent, so far above high-water mark, as to render it capable of receiving batteries at the summit, at the middle, and at the two extremities: these were little more than ideas. The only practical result of this plan during the period of war that followed, that by the year 1803 the centre portion only of the dike was brought above high-water mark. On this was built a battery, which, together with a garrison of soldiers, was swept away during a violent hurricane in the year 1809.

The condition in which the breakwater has been left is thus described in the 'Encyclopædia Britannica':—"At present small spots only are visible above the surface of the sea at low-water of spring-tides, and nowhere such spots exceed three feet in height. The intermediate spaces are from three to fifteen feet below the surface: and, taking the average, the whole height from one end to the other is less than five feet below the surface of low-water at the spring-tides. Near the middle, however, there is about one hundred yards where the height rises to eighteen or twenty feet above high-water, but it exhibits only a shapeless mass of ruins. In one spot a large heap of stones has been accumulated, as if to try how much weight might safely be trusted upon it, before the attempt be made to rebuild the fort. The largest of the stones in this mass may be about four tons, and they decrease to the size of two or three cwt. Of the remainder of the dike very few parts are visible at low-water; and at this moment the greater part is four feet below the surface of low-water. It is sufficiently high, however, to break the face of the sea, and to make the port of Cherbourg a safe anchorage, in some winds, for about forty sail of the line.

Hedges.—The Dwarf Oak is a handsome prickly-leaved evergreen, making such a tall close hedge as to afford not only good shelter to the field, but defy either pig or bullock to break through, while it furnishes a good annual crop of pig-food in its acorns; besides a crop of that valuable article in dyeing, the gall-fruit. The wonder is, that from the above qualities it has been introduced into England, where it would soon change the whole winter aspect of the country, the hedge-rows exhibiting throughout the year the bright green freshness of perpetual spring.
THE PENNY MAGAZINE.

THE GANGES.

The Ganges flows through some of the richest portions of the earth, embellished by the fertility and splendour of an exuberant vegetation, and peopled by sixty millions of the human race. Descending from the Himalaya Mountains, where it has its source, it soon reaches the plains, and after receiving many tributaries, some of which are larger than the Rhine, it empties its waters into the ocean by several mouths, completing a course of above fifteen hundred miles, and draining a tract of country eight times larger than England.

The country through which the Ganges flows is divided into three natural districts: 1. The great plain of Bengal, which we shall first describe, extending from south to north two hundred and eighty miles by one hundred and eighty wide, and comprising four marked tracts of country, commencing with the Sunderbunds, a district between the mouths of the Ganges and the Brahmapootra. This is the most unhealthy part of India, and its appearance is thus described by Bishop Heber:—"Nothing met the eye but a dismal and unbroken line of thick black wood and thicket, apparently impenetrable and interminable, which one might easily imagine to be the habitation of everything monstrous, disgusting, and dangerous, from the tiger and the cobra de capello, down to the scorpion and mosquito—from the thunder-storm to the fever." The Sunderbunds are swampy all the year round, entirely uncultivated, and inhabited only by a miserable population employed in cutting timber. The next part is "the country subject to inundation," lying between the Ganges and its branches, and also between that river and the Brahmapootra, as far as 25° north latitude.

At the junction of the two rivers an immense tract of country is overflowed to the depth of many feet, and the towns and villages are built on artificial mounds. The depth of alluvial earth is often one hundred and thirty feet, and wells cannot be sunk. As soon as the waters subside, rice is sown, and this district could supply the whole of Bengal with that staple article of food. In these alluvial tracts the rivers easily change their course, and there are old beds of the Ganges at a distance of several miles from the present channel. The third district, which is partly situated west of the Hooghly, and partly north of the twenty-fifth degree of north latitude, is not subject to inundation, except near the rivers in the northern part; but the soil abounds with springs, and irrigation is extensively practised. The country is luxuriantly productive in cotton, indigo, sugar, and grain; and the silk-worm is cultivated. Towards the northern extremity of this tract there are large portions of waste land. The fourth district, situated between the plain of the Ganges and the lower region of the Himalaya Mountains, is called the Tarai, or "the swamp," and in the province of Bengal has a width of from twenty to twenty-five miles, but narrows to the width of a few miles towards its north-western extremity. The soil is a rich alluvium, and the waters which flow from the higher regions form a swamp in consequence of the slope being insufficient to drain them off. The vegetation is exceedingly rich and profuse; but the heat, acting upon so moist a surface, engenders disease, and the only inhabitants, except elephants, rhinoceroses, tigers, buffaloes, and other wild animals, are a few wood-cutters.

The second great district drained by the Ganges is divided from Bengal by the river Coosy, and the Rajmahal

[Boats on the Ganges.]
over which is thrown a coarse cloth. The master steers country amidst villages raised slightly above the vessel; have high heads, with large, clumsy rudders. The views on the banks are not less interesting or suspended by ropes, and worked by helmsmen raised lively than those on the river. Eventhe tedium of simple and rudest of all possible structures. It is, "populous parts of Europe. From an ample terrace, of bamboo and straw, exactly like a small cottage, trades. These are not unfrequently flanked with ill-appointed vessels. The Bengalee and Chittagong hands to catch the favouring breeze. They are generally crazy and each holding takes up nearly two-thirds of the vessel, upright performing their orisons in the stream. Nothing can bamboos are fixed by its side, which support a kind of deck over, throughout its whole length, at the summit of the bank, broad steps descend into a vellas in navigating the boat, and six cross-legged Roberts, in her 'Scenes and Characteristics of India,' describes them moving a panorama which glides on its bosom. At every point of land may be seen what Heber terms "a coprice of masts," waiting for a wind, while other vessels, with their masts down, drift with the stream. In one part of his voyage he speaks of the number of fishing-boats as "very extraordinary," most of them carrying a small sail spread between two bamboos, or a mast made of one wale; and sometimes two of the crew might be seen, each holding a garment extended by the feet and hands to catch the favouring breeze.

The views on the banks are not less interesting or lively than those on the river. Even the tediousness of tracking or hauling is compensated by the beauty of inland objects. The river itself, glistening in the sun, with its moving scenery of boats and vessels, is often several miles wide, and at the period of the inundations the voyagers sail over the inundated country amidst villages raised slightly above the water. In tracking, the boat is often not more than two or three yards from the shore; and the late Miss Roberts, in her 'Scenes and Characteristics of Hindostan,' thus describes the moving panorama which then passes before the voyager:--"The smallest villages on the banks of the Ganges possess landing-places, which we vainly seek in the richest and most populous parts of Europe. From an ample terrace, at the summit of the hill, a grand descent to the river, enclosed on either side by handsome balustrades. These are not unfrequently flanked with beautiful temples, mosques, or pagodas, according to the creed of the founders; or the ghaut is approached through a cloistered quadrangle, having the religious edifice in the centre. The banyan and the peepul fling their sacred branches over the richly-carved minarets and pointed domes, and those in the Brahminie villages are crowded with troops of monkeys, whose grotesque and diverting antics contrast strangely with the devotional attitudes of the holy multitudes performing their orisons in the stream. Nothing can be more animated than an Indian ghaut; at scarcely any period of the day is it destitute of graceful bathers, while graceful female forms are continually passing and repassing, loaded with water-pots, which are balanced with the nicest precision on their heads. The ghaut, with its cheerful assemblage, disappears, and is succeeded by some lofty overhanging cliff, wooded to the top, and crowned with one of those beautiful speckled tents by which bedouins are distinguished, and richly profusely over the whole country. Green vistas next are seen, giving glimpses of rustic villages in the distance, and winding alleys of so quiet a character, that the passer-by may fancy that these sequestered lanes lead to the cottage-homes of England.--a brief illusion, speedily dispelled by the appearance of some immense herd of buffaloes. The savage herds...
are left behind, and the scene changes again; deep forests are passed, whose unfathomable recesses lie concealed in eternal shade. Then the cultivation returns, wide pastures are spread along the shore, covered with innumerable herbs; the gigantic elephant is seen under a tree, fanning off flies with a branch of palm, or pacing along, bearing his master in a howdah through the indigo plantations. European dwellings arise in the midst of park-like scenery; and presently the wild barbaric peasant of a native city bursts upon the astonished eye. Heber also remarks that some of the villages on the banks of the river, surrounded by natural meadows and hedge-rows, were so like English, that but for the cocalas we could have supposed ourselves at home. Some of the villages are as neat as any of those in Europe, shaded by banyans, palms, peepuls, tamarinds, and various flowering trees, and situated in the midst of fields of rice, cotton, sugar-canes, or indigo—the latter, when cut, smelling like new-mown hay.

The navigation of the Ganges by the common river-boats is far from being sufficiently quick for commercial purposes. At the period of the inundation the navigation is most speedy, the wind generally blowing from a quarter which enables a vessel to stem the current by sails, while if proceeding downward the time amounted to an immensitreasure. It however had the effect of doubling the expenses; for vessels were sent most liberally from all parts, and in a short time amounted to an immense treasure.

The new temple stood between the city and the port, and was built at the base of a mountain, at the head of a marsh, which situation is said by Pliny to have been chosen as less liable to earthquakes. It was four hundred and twenty-five feet in length and breadth, supported by one hundred and twenty marble pillars. The temple was completed by the contributions of all the cities of Asia (Proper?). It was four hundred and twenty-five feet in length and breadth, built on a site which Pliny says was sacred to the goddess Diana, and the altar was almost entirely the work of Praxiteles. The altar was made of stones from the quarries of the country and was used as an altar of sacrifices and the Oreads, who were said to have been the protectors of the temple, were worshipped under a variety of names, characteristic of the country.

The temple of Diana at Ephesus was counted as one of the seven wonders of the world, on account of its extent and magnificence, at the period of the birth of Christ. The same rank was held by an earlier temple than that which existed at this time. Xerxes, the Persian king, who destroyed the idol temples wherever he came, spared that one on account of its extreme magnificence and grandeur; but it was set on fire, on the night Alexander the Great was born, and burned to the ground. This was done by a man named Erostratus, who confessed that he had done the deed to immortalise his name by the destruction of this wonderful building. To baulk him, it was decreed that his name should never be mentioned; but such a decree served only to make his name more memorable. Alexander offered to rebuild the temple, on condition that the Ephesians would allow his name to be placed in front; but this offer was respectfully declined. The materials saved from the fire were sold, and the women parted with their jewels; and the money thus raised served to carry on the work till other contributions came in. These forms were sent from all parts of Asia, and in a short time amounted to an immense treasure.

The new temple stood between the city and the port, and was built at the base of a mountain, at the head of a marsh, which situation is said by Pliny to have been chosen as less liable to earthquakes. It was four hundred and twenty-five feet in length and breadth, supported by one hundred and twenty marble pillars, the water that came down the hill into the morass and a structure, Pliny says that there were laid beds of charcoal, well rammed, and over them others of wool, and that two hundred and twenty years elapsed before this grand temple was completed by the contributions of all the cities of Asia (Proper?). It was four hundred and twenty-five feet in length and breadth, supported by one hundred and twenty marble pillars, the water that came down the hill into the morass and the Dyas. It was four hundred and twenty-five feet in length and breadth, supported by one hundred and twenty marble pillars, the water that came down the hill into the morass and the Dyas.
names and different impersonations. She was the goddess of hunting, of travelling, of chastity, of childbirth, of enchantments, &c.; and in her different characters she was Diana, Luna, Lucina, Hecate, Proserpine, besides many other names. She clothed the places in which she was worshipped. Her most usual figure was that of a huntress, with a crescent on her head, and attended by dogs. But the Ephesian Diana was differently represented from any other, being figured with several tiers or rows of breasts—intimating that she was at Ephesus regarded as Nature, the mother of mankind. The image wore a sort of high-crowned cap or mitre, with its four corners involved in the garments. Notwithstanding what the "town-clerk" says, in Acts, c. xix., v. 35, about "the image which fell down from Jupiter," it seems that Mucianus, who had been three times consul, and whose authority Pliny follows (lib. xvi., 40), learnt at Ephesus that this famous image was the work of a very ancient sculptor named Canetias. As he further states that the original statue had never been changed, it must have been the same to which the "town-clerk" there refers. It seems to have been an ugly little statue, made of several pieces of wood—generally said to be ebony, but Mucianus thought vine-wood—which precluded the otherwise possible idea that the material might have fallen from the sky in the form of an image of the goddess. Independently of the priests availed themselves of the remote antiquity and the uncouth form of this image to persuade the people of its divine origin. —From the Pictorial Bible.

The Whirlpool of Niagara.—The river, which has gradually contracted its channel very much, after passing the great white sheet of the American Fall, proceeds in a curved form towards the north-west; and after falling over tremendous rapids, suddenly turns at right angles to its former course, and runs towards the north-east, still hemmed in by the precipice, which necessarily increases in altitude. Here it has scooped out a vast basin in the rocks, of a circular form, and the rushing and roaring waters, entering the narrow gorge from the south-east, strike by their impetus with such force on the perpendicular wall of the opposite gorge, that an under-current is immediately created, and the waters whirl in a dizzy vortex, until they find egress towards the north-east, between the precipitous walls of the chasm. As the rock is very lofty here (between two and three hundred feet), the view from above is so distant, that very little but the facings of the waterwhirling or concentrically enlarging circles of the water can be traced; for the largest trunks of trees which are spinning in its eddies seem there no bigger than sticks. It is from below that the curious visitor must see the structure of the descent; but the descent is slaughteryardlike, and in the vicinity of Table Rock, nearly like that at the Falls, and probably produced by a similar cause, the disintegration of the slate formation under the more unyielding limestone. So extensive, however, is the surface of water, that the huge trunks of trees floating in the concentric circles of the whirling waters, when they reach their ultimate doom in the actual vortex, appear still not larger than small logs. They revolve for a great length of time, touching the shores in their extreme gyrations, and then, as the circles narrow, are tossed about with increasing rapidity, until, in the midst of the rushing waters, the largest giants of the forest are lifted perpendicularly, and appear to be sucked under in a time altogether. A singular part of the view is the very sharp angle of the precipice, and its bank of débris on the American side. You also just catch a view of the foaming rapid on the right; and an attentive observer will perceive, that in the centre of the vast basin of the whirlpool the water is several feet higher than at the edges, appearing to boil up from the bottom... It is said that timber is sometimes carried from the upper part of the river, sometimes for months, before they are finally engulfed in the whirlpool, and doubtless it is never free from them; and perhaps there may be occasionally a counteracting current from the various winds which rage there still, in order to prevent their approach to the centre; and in this way those who have escaped, have escaped merely because they were only tossed about in the outer rings of the whirl, and never approached its tremendous centre, from which, I conceive, by an under current, the water escapes or emerges, as the case may be. But once involved, nothing could possibly emerge; as the very boiling up of the waters, and the tremendous force exerted there on the trees and logs, evince. The visit to the shores of the whirlpool may be attended with the gratification of another kind of curiosity to the naturalist, for lie may there see the rattlesnake in his native horrors. The boy who went with me as a guide endeavoured to find a den or cleft in which this tremendous reptile might be lying, but he was unsuccessful, although they are frequently seen and killed there, being, after all, fortunately sluggish and inactive. We saw other snakes, but not the dreaded one.—The Canadian in 1841, by Sir R. Bonyycastle.

Rhubarb.—This valuable plant should occupy a corner in every garden, however limited; and the botanist will find it useful and wholesome for himself and children, from its medicinal properties. It is a valuableAGENT of temper and tincture, which are made of the stalks, they may be boiled and eaten with bread; by blanching the stalks, which is readily done, they are not only improved in flavour, and come to perfection earlier, but one-half the quantity only of sugar is required: to accomplish this, it is not necessary to exclude the light; a large butter-firkin will do this, or a few hazel rods or rails covered with fern or straw, or any similar means, as circumstances may dictate.

If the crowns have been mulched during winter, the plants will be forwarded.

Bridges in the Himalaya.—Among the characteristics of this Alpine country, intersected by numerous unfodorable streams, must be mentioned the various kinds of bridges, or substitutes for bridges. The sango, or wooden bridge, is sometimes only a single plank thrown across a chasm, or perhaps a notched tree in an inclined position. But more frequent than the wooden bridge is the jhoola, or rope bridge, which consists of five or six cables, formed of a sort of grass, named moonja. These are placed close together, and above is a hollow piece of fir-wood, secured by cords, which serves as a seat for passengers, and also as a receptacle for baggage. This block is pulled across by two pieces of twine, and the conveyance is pretty safe, but greatly alarming to a person unused to it, as the stream rushes with frightful rapidity beneath. The longest bridge of this kind I crossed at a point called Rampoor, where the river is two hundred and eleven feet broad. At Wangtoo it is only ninety-two feet; but the velocity of the current is so great that two of my servants, who once crossed it, were so afraid, that they would not venture again, and preferred swimming over; one of them reached the opposite bank with difficulty, being completely exhausted, and the other was drowned. The zuzum, of which there is a bad one below Numega, is formed of twigs, very indifferently twisted; there are five or six cables for the feet to rest upon, and side ropes. About four feet above the others, to hold by, connected with the lower ones by open wicker-work or ribs, one or two feet apart. The side ropes are at a most inconstant distance from each other, and in one place they were so far apart that a person cannot reach them under the water; but, with both his arms extended, the ropes, from being constructed of such frail materials, do not bear much stretching, and the bridge forms a curve the sixth part of a circle. Frequent accidents have occurred here; and only a month before I crossed, in August last, two people were lost, by one of the side ropes giving way. The guides that accompanied me did not tell me of this until they saw ten or twelve of my loaded followers upon the bridge at once. I was standing on the bank at this time, and the noise of the accident spread with rapidity; and some of my followers, who were so mitigated as to think they could neither move one way nor another, and stood trembling for a long time. Two, in greater terror than the rest, precipitated my tent into the Sutluj.—Captain Gerard's Account of the Himalaya.
A HUNDRED and twenty years ago, Dr. Arne, then a stripling, who, like many other striplings, loved music much better than the study of the law, used to delight in practising by stealth after the family had retired to rest. He had in his bed-room an old spinet, from which, after muffling the strings to deaden the sound, he drew such tones as it could afford, and which have been described as "weak, wiry tones, between a cough and a chirp, elicited by keys rattling like the dry bones of a skeleton."

If Arne, or any one who, like Arne, had been accustomed to the clavichords, the virginals, the spinets, and the harpsichords of past ages, could see a pianoforte of modern times, how great would be the change perceived! All these instruments, together with the psaltery, or dulcimer, act on the same principle, a principle which marks a separation between them and the violin on the one part, and the lute, the harp, and the guitar, on the other. This principle is the striking of a stretched cord, to produce from it the tone due to its length, thickness, and tension; yet though fundamentally the same, how different in effect are these several instruments! The modes in which the principle is modified in the several forms of instruments are curious, and may thus be briefly glanced at. The ancient psaltery (nearly the same instrument as the modern dulcimer occasionally seen in our streets) was probably the original whence all the others have emanated; and, according to Mr. Hogarth, "consisted of a square box of small depth, over which was placed a sounding-board of fir, and on this sounding-board were stretched a set of strings of steel and brass, tuned to the notes of the scale." They were struck or played upon by two little rods held in the hands of the player. A great change was effected when the little rods were abandoned, and mechanism introduced whereby each string was provided with a lever which struck it. The lever constitutes the key of such instruments as this, and, in the form of an instrument called the clavichord, was provided at the hinder end with a little brass wedge that struck the string when the front end of the key was pressed down. To improve the tone elicited from the string the brass wedge was superseded by a quill, and the instrument then acquired the names of the virginal and the spinet. As a still further improvement, it was proposed to have two strings to every note, so as to increase the volume of sound; this involved a considerable increase in the complexity of the mechanism, and the improved instrument, under the name of the harpsichord, was in high repute during the greater part of the last century. At length occurred the happy thought of dispensing with the quills, and using little wooden hammers covered with leather, as a means of eliciting the tones of the strings, a modification which gave rise to the modern pianoforte, so named from the power of the
instrument in producing "piano" and "forte," or loud and soft effects.

It has been said, in a recent article of the Westminster Review—"With a little allowable flattery of the truth, the bookcase, in an inventory of the goods belonging to any well-ordered English house, might be designated as one of its necessary articles of furniture—not as one of its luxuries: the place of popu-

larity among the latter being claimed by the piano-

forte." Whether we rank it as an article of furniture or as a luxury, it is certain that the pianoforte has become diffused in an extraordinary degree in this country. Those who can carry their recollection back over a period of thirty or forty years, will remember the pianoforte as an instrument for the noble and the wealthy, sparingly seen in the houses of the middle classes: they will remember the gradual steps by which it has reached the domestic firesides of the bulk of the class just alluded to; and they will be prepared to expect that such an extension in the use must have brought along with it extensive plans of improvement, and new and s?"teven manufacturing arrangements. Yet there are probably few, even of those who are familiar with the use of the pianoforte, who are aware of the complex mechanism of the modern instruments, or of the gigantic scale on which the manufacture is conducted. On these points we shall endeavour to offer a few words of information, which we are enabled to give by the courtesy of Messrs. Broadwood, the eminent manufacturers. This firm, which has existed in the metropolis for more than a century, is one of those by whom the pianoforte has been brought to its present state of perfection. Like most other products of ingenuity, this instrument is indebted to many minds for its advancement. One improvement, we owe to a Broadwood, another to an Erard, others to the Clementis, the Stodarts, the Tomkisons, &c., and all have profited by the labours of each.

Messrs. Broadwood's principal factory is situated in the Horseferry Road, Westminster, in the immediate vicinity of two other establishments which have already engaged our attention, viz., the "London Marble Works," and the "Westminster Gas Works." Whoever might conjecture that a pianoforte factory was merely a large workshop in the rear of the warehouse in which the finished instruments are sold, would be somewhat astonished at visiting the one to which we allude. In the Horseferry Road are two double gates, opening for a quadrangle of buildings, known as the "Horseferry Street, three hundred feet southward of it, are two other gates, also opening immediately on the same quadrangles; and the whole of the intermediate space, spreading to a wide extent east and west, is occupied by the factory. On entering one of the gates, we find before us a long open court, occupied principally by piles and tiers and logs of wood, and bounded on either side by ranges of workshops extending three hundred feet in length. Advancing half-way along the court, we find, on either side, an archway, leading beneath the buildings to other courts or open quadrangles, one to the east and one to the west of that by which we enter: these quadrangles, like the first, are bounded on both sides by long and uniform ranges of workshops. We are then enabled to see the extent and form of the factory. It consists of four parallel ranges of buildings, every range lighted by windows on both sides, and having in general three tiers or stories of workshops in height.

The four ranges are covered by the three court- yards, and at the ends are four or five dwelling-houses inhabited by the superintendent and foremen of the establishment. Each range is wide enough to have in most parts two workshops in width; and as most of the ranges are three stories in height, there is an aggregate length of workshop truly enormous, in fact it considerably exceeds half a mile—an extent to which there are probably very few parallel instances in the metropolis.

In these four ranges of buildings three or four hundred men are engaged on the various component parts of pianofortes, from the first sawing of the rough timber, to the polishing and regulating of the finished instruments. Besides these there are many others engaged in the smaller branches of the manufacture, who do not work on the premises. In many of the workshops the employment seems to the eye of a stranger to differ but little from common joiner's or cabinet work; while in others it has evident relation to musical arrangements. These distinctions we may exemplify by taking a hasty glance through all the four ranges of buildings.

The eastern range is occupied at one end by stores of mahogany and other woods, piled up for seasoning. Then we come to shops occupied by 'packing-case makers' and 'bottom-makers,' the latter of whom make the strong framing which forms the bottom of a pianoforte. Above these are workshops in which "square-case makers," and 'sounding-board makers' or 'belly-men,' are at work. To understand these technical terms, it may be well to remark that modern pianofortes are divided into five classes, viz., grand, semi-grand, cabinet, cottage, and square (the distinctive characters of which we shall explain farther on); that the case is the hollow box in which the mechanism of the instrument is contained. A 'square-case maker,' then, is the workman who makes the hollow case for a square pianoforte. One 'sounding-board,' or 'belly,' is a thin plank of fir, to which some of the internal mechanism is fixed; and its use is to augment the sounds emitted by the strings: the 'bellyman' is the maker of a 'sounding-board.' The upper floor of this range, like part of the middle floor, is occupied by 'square-case makers.' At the north end of this building are extensive open sheds, in which mahogany logs and planks are stored up for seasoning previous to use.

In the open quadrangle which separates the east range from that to which some of the internal mechanism is fixed; and its use is to augment the sounds emitted by the strings: the 'bellyman' is the maker of a 'sounding-board.' The upper floor of this range, like part of the middle floor, is occupied by 'square-case makers.' At the north end of this building are extensive open sheds, in which mahogany logs and planks are stored up for seasoning previous to use.

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Another portion of the lower floor of this range is occupied by 'hammer-makers,' workmen employed in making the minute and complicated mechanism by which the keys are brought into connexion with the strings of the instrument. On the upper floor are repetions of some of the arrangements seen below, such as 'case-makers,' 'belly-men,' and 'finishers,' together with another class of workmen not yet spoken of—viz., the 'key-makers.' Contiguous to the northern end of this range is a series of saw-pits, in which the logs are cut. Some of the buildings, too, have flat leaded roofs, on which timber is placed for the better exposure to air and sun.

On the opposite side of the middle court is the range wherefor the sake of distinction we will term the west central range. Our frontispiece presents a view through part of one of the workshops in this range, and will serve to convey some idea of the general appearance of these extensive shops. It is one of the 'cabinet finishing shops' where the cabinet pianofortes go through some of the later processes of the manufacture in the make of claw. The length of the shop is shown in the cut.

The shop just alluded to is on the middle floor of the west central range; the upper floor being occupied by 'square-case makers' and 'belly-men;' and the lower by 'regulating and tuning rooms,' a 'glue-room,' and a 'wood-store.' The pianofortes are arranged in a shed amongst other costly specimens of veneer, some slabs or sheets taken from a tree which has had much notoriety, and which strikingly illustrates the value placed upon fine wood. Logs for veneers are valued partly on account of the beauty of the pattern or figure, and partly on account of the size and soundness of the veneers which may be cut from them; in the instance here spoken of the two qualities were combined in an unprecedented degree. It is generally known that Honduras mahogany is not so highly valued for cabinet-work as Spanish mahogany; it is therefore in the pianoforte manufacture used for some of the parts which are afterwards veneered with Spanish mahogany, rosewood, or some other kind of fancy wood. But in the present case a tree of Honduras mahogany, imported about sixteen years ago, has far exceeded what Spanish wood could exhibit. The circumstance was thus alluded to in one of the volumes of the 'Library of Entertaining Knowledge,' a few years ago—"Spanish mahogany is decidedly the most beautiful; but occasionally, though not very often, a tree of the Honduras wood is of singular brilliancy; and it is then eagerly sought for, to be employed in the most expensive cabinet-work. A short time ago Messrs. Broadwood, who have long been distinguished as makers of pianofortes, gave the enormous sum of three thousand pounds for three logs of mahogany. These logs, the produce of one tree, were each about fifteen feet long and thirty-eight inches wide. They were cut into veneers of eight to an inch. The wood, of which we have seen a specimen, was peculiarly beautiful, capable of receiving the highest polish; and, when polished, reflecting the light in the most varied manner, like the surface of a crystal; and from the wavy form of the fibres offering a different figure in whatever direction it was viewed." The price, we are told, is here erroneously stated at three thousand pounds; it was about two thousand, averaging nearly five guineas per cubic foot! The figure of this wood somewhat resembles the ripple or small waves of the surface of the ocean, and perhaps from this circumstance it has obtained in the factory the name of 'ocean-wood.'

An archway under the west central range leads us to the western court, which will terminate our tour of the premises. The workshops on either side of this court exhibit, in addition to some similar to those before noticed, a 'turner's shop,' where the legs for pianofortes are turned; a 'stringer's shop,' where the strings are attached to some of the instruments; and shops wherein are made a number of minute pieces of mechanism connected with the keys, such as hammers, dampers, &c. This open court, too, like the others, has its stores of timber; and at one end of the west central range is a series of about ten or a dozen saw-pits, where the logs are cut into planks.

It would be no easy task, nor indeed would it be necessary, to describe the arrangements of the various departments of workshops. It may suffice to say that they bear some resemblance to the shops of a cabinet-maker, in relation to the materials and the tools employed. The work-benches, about three hundred in number, are placed in general transversely, with one end towards the windows; and on the side opposite to the windows are the stoves and fire-places for warming glue, and other operations in which heat is required. Overhead, in nearly all the shops, are piles of wood in various stages of preparation for the use of the work-
A pianoforte in its several stages of manufacture.

Whatever form or value the pianoforte may have, it consists of a case containing stretched wires, which wires are struck by soft hammers, attached to the hindmost end of the finger-keys. This being the general character of the instrument, the various subdivisions are as follows. It was stated in a former paragraph that the harpsichord was an improvement on previous instruments, by having two strings to every note; this improvement has been retained in the pianoforte, together with the later one of having soft hammers instead of quills. The 'tinkling grandfather or the pianoforte,' as the clavichord has been called, had but four or five octaves; the harpsichord five or five and a half; but the pianoforte has extended its range to six and a half. These points being remembered, then, we may state, 1st, that the square pianoforte has the strings horizontal, in a rectangular case, with two strings to each note, and a compass varying from 5½ to 6½ octaves. The cabinet or cottage pianoforte has its strings arranged vertically, reaching nearly from the ground to a short distance above the level of the keys: the case is much shorter than in the 'square,' there are two strings to each note; and the compass is generally six octaves. 3rd. The cabinet pianoforte is much longer than any other, except the upright grand, a form not now manufactured: the strings are arranged vertically, reaching nearly from the ground to a short distance above the level of the keys; the case is much shorter than in the 'square;' there are two strings to each note; and the compass is six octaves. 4th. The grand pianoforte is longer than any other; it is wider at one end than the other, and, unlike those hitherto mentioned, has the keys at one end; the strings are horizontal, and the chief feature whereby the instrument is distinguished is, that there are three strings to each note; the compass is always six octaves and a half, and there are thus upwards of two hundred and twenty strings. 5th. The semi grand pianoforte is, as its name imports, a modification of the 'grand;' it has his strings horizontal; its case somewhat resembles that of the 'grand,' but it is shorter, has a compass of only six octaves, and has but two strings to a note. These are the five forms of pianoforte now made; and the manufacture of course involves certain modifications to suit the various forms. As a means of showing the relative proportions in which the various parts of a pianoforte are manufactured, we find that out of the eighty or ninety thousand pianofortes which have been made by this firm, there have been, to every hundred 'squares,' twenty-eight 'grands,' sixteen 'cabinets,' nine 'cottages,' and five 'upright-grands' and 'semi-grands;' so that the 'squares' constitute nearly two-thirds of the whole number.

The case, being a hollow box veneered on the outside, is made in a manner nearly similar to cabinet-work generally. In the 'square' form it is an oblong rectangle; in the 'cabinet' it is lofty; and in the other three forms it is modified in various ways. The most scrupulous care is taken in the selection of wood, not only in reference to its perfect dryness, but to the combining of two or three sorts together, so that each kind of wood may render its peculiar properties in aid of the others. Nearly all the work-benches at the factory are provided with a simple but valuable arrangement for pressing and keeping together the pieces of glued wood while drying. At a height of about four feet above the bench is a false ceiling; and the glued pieces being laid on the bench, a number of elastic wooden rods are placed nearly vertical between the false ceiling and the bench; being longer than the interval in which they are to be placed, they can only be adjusted by a slight bending or convexity in their length; and this bending gives them a very powerful pressure on the bench beneath or on the glued pieces placed on the bench. In some instances we saw thirty or forty of these bent vertical rods employed on one piece of wood. When the glueings are dry, a slight blow or jerk will remove each rod.

Without attending to the technical names applied to the various parts of a pianoforte, we shall, perhaps, be understood by general readers when we speak of the frame-work of the instrument as distinct from the mere outer case. If we open a pianoforte, especially a 'grand,' we shall see bars and rods and strengtheners of various kinds, placed in different directions, not only with a view to give form and stability to the instrument, but to resist the powerful strain to which it is exposed by the tension of the strings. This tension is truly extraordinary, and requires for its due appreciation a little consideration of the phenomena of a stretched string or wire. Let us suppose that a wire or string is wound round a peg or pin, and that it is merely brought into a straight line without any attempt at stretching it. If struck with a soft hammer, it will yield a low sound, due to a small number of vibrations per second; but if we wish to elevate the pitch of the tone, we can do so by increasing the tension or stiffness of the wire, and this increased rapidity gives a more elevated pitch to the tone elicited. Now, in conformity with one of the laws of force, the wire pulls with a power equal to that by which it has been stretched; it tends to regain the state which it originally had, and by this tendency exerts a powerful dragging or pulling force on the pins to which its two ends are attached, and on the frame-work wherein the pins are inserted. This force is exerted by every wire, according to its tension to it; and the aggregate force is surprisingly great. It is calculated that the two hundred and twenty-five wires or strings of a grand pianoforte exert a strain of more than twenty thousand pounds! 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Ist, by shortening the string; 2nd, by increasing its thickness; or 3rd, by increasing its tension. Now the manufacturer does not adopt any one of these methods of adjusting the tones, to the exclusion of the others he avails himself of all. Twelve strings of the same length and thickness might be so different in tension as to yield the twelve semitones of an octave; twelve strings of the same thickness and tension might be of such different lengths as to yield the twelve semitones; or, lastly, twelve strings of the same length and tension might be made to produce these effects by having the thicknesses different. But in practice the tones produced by either of these methods would be very defective in character. Each degree of thickness, of length, and of tension, produces its own peculiar effects on the 'timbre,' or quality of tone. If two strings of the same length and thickness were so stretched as to produce tones differing by an octave in pitch, one would be strained nearly to breaking, and the other would produce a dull, weak, and smothered sound. If, while producing these two notes, the strings differed only in length or in thickness, the qualities of tone would not be so much at variance as in the case just supposed; but still the required capable character of tone would not be produced. The plan adopted, therefore, is, to let the length, the thickness, and the tension, all vary together. This explanation will enable us to understand the reason for the observed difference in the strings of the pianoforte. We perceive that the strings for the upper notes are not only shorter but also thinner than those for the lower; and we should find, though it is not perceptible to the eye, that the tension is likewise different. The thickness, the length, and the tension, all diminish (but not uniformly), from the lower to the upper notes; tension being here used to express the force employed in stretching the string to the required degree. In a grand pianoforte there are fourteen different thicknesses of wire; the smaller, for the upper notes, being plain polished steel-wire, and the thicker, for the lower notes, being coated with a very fine coil of copper-wire.

In adjusting the strings there are certain rules as to the thickness of wire selected for a certain note; and the vibrating length of each string is regulated by a curved piece of wood, called a bridge, fixed on the sounding-board of the instrument. To make and adjust this bridge is one of the most delicate operations of the 'bellyman' or 'sounding-board maker.' The curve itself is regulated by a gauge to which the maker works: so is the position which it is made to occupy in the sounding-board; and so likewise are the order and arrangement of the pins inserted in it. These pins are so placed that the strings rest against them, each string being bent out of its rectilinear course by coming in contact with a pin. A portion of the string is thus effectively cut off, so far as regards the vibration; and the manufacturer is thus enabled, by the adjustment of the pins in the sounding-board, to give to the strings any vibrating length corresponding to the tones to be produced. So complex and important are these arrangements, that the strings of an improved grand pianoforte require nearly one thousand iron pins or prgs, each one inserted in a hole made with great exactness to its dimensions. The workmen called 'stringers' fix the proper strings to the proper pins. The pins are first fixed in a frame, and then inserted about five or six inches in diameter, each coil containing enough wire for several strings.

Hitherto we have said nothing of the mechanism by which the strings are struck,—by far the most curious part of a pianoforte. This mechanism obtains the general name of the 'action;' and when we hear of 'square-action,' 'grand-action,' &c., we must understand these terms to allude to the particular mode in which the percussion is effected. It is perhaps scarcely too much to say that three-fourths of the improvements which the pianoforte has undergone during the present century have had relation to the 'action.' All the great firms for which the metropolis is distinguished in this branch of manufacture have brought forward some or other improvements in this respect; and their united labours have raised the instrument to such a stage of perfection, that—like the chronometer—there is little more to be wished for, unless indeed it were possible to obtain the sustained tones of the organ.

The most obvious part of the 'action' is the key-board and its mechanism. Every ebony or ivory key is a lever, which, when pressed down at the foremost end, rises at the hindmost, and this leverage is the source of all the effects subsequently produced. A little examination of these keys will show that the ebony is solid, but that the ivory is merely a veneer or scale put on a substratum of wood. The white keys are made of carefully prepared lime-tree wood, which is cut after the pieces of ivory are attached. The annexed cut shows the appearance of the key-board while being cut up into keys. The pieces of ivory are shaped and prepared by the ivory-worker to the exact size for each key, and are glued side by side on the surface of the wood. The wood is marked out by a gauge, and is then cut up into parallel pieces for the keys, by means of a slight frame-saw. A notch is made in the stem or shaft of every white key to receive the ebony key and its stem. When all the keys are cut, a little piece of mechanism is placed in one particular part of the length of each, to form a fulcrum.

To the hindmost part of each key is attached the mechanism whereby it is made to act upon the string; and this mechanism, to which the name of the 'action' is more particularly applied, presents a complexity of arrangement that will baffle everything like a popular description. Simple as the 'square' piano-forte is when compared with the other forms, yet the following cut will show that the 'action' attached to each key is anything but simple. This cut represents a 'square treble-action,' that is, such a portion of the keys and connected mechanism as belong to about an octave and a half of the 'treble' or upper part of the instrument. This piece of mechanism is represented as viewed from behind, the most favourable position for displaying the intricacies of the 'action.' It is seen that there are a number of small pieces placed at various angles, and acting upon one another by various species of leverage.
But this 'action' dwindles into insignificance when compared to that of a cabinet pianoforte in its most improved form. We know of nothing, except the mechanism of a watch, to rival the latter in intricate combinations. One part of the mechanism attached to each key is to cause the hammer to strike on the string; another is to regulate the degree of strength or softness with which the blow is struck; a third is to prevent the rebound of the hammer after the blow; and others are to produce modifications of effect so minute that nothing but the most refined skill in pianoforte playing could render them either appreciable or necessary: indeed the advance of the manufacturer, and the advance of the players in skill, reciprocally measure each other; for while on the one hand the resources of the instrument were never thoroughly known until a Liszt, a Thalberg, a Herz, or a Moscheles developed them; so on the other hand these great players would never have been able to produce the exquisite effects for which they are so celebrated.

When we say that all these minute pieces are fashioned and adjusted by hand, it will be readily compared to that of a cabinet pianoforte in its most improved form. We know of nothing, except the mechanism of a watch, to rivality the latter in intricate shapess. An important and very curious part of the labour is the adjustment of these little pieces of vellum, cloth, felt, and leather. Vellum is used for the hinges of some of the minute parts; the two ends or edges of the vellum being glued into slits in the two pieces which are to be hinged together; and it thus forms a hinge peculiarly delicate in its action. The little pieces of cloth are used in various ways, in the production of the sound which pieces of leather and felting the hammers. The felt used for this purpose at Messrs. Broadwood's, and which is a beautifully soft white substance about a fourth or fifth of an inch thick, is said to be made from wool growing on Prince Esterhazy's estate in Hungary, the quality of this wool having been found admirably adapted, from its softness, for this purpose.

In speaking of the strings for the various forms of pianoforte we stated that the 'grand' has three strings to each note; and that each of the other four forms has two. The adjustment of all these strings is an important matter, and devolves upon the 'regulators' and 'tuners.' It will of course be understood that in no case the two or three strings belonging to one note must be tuned in unison; and to effect this the strings are, as may be supposed, of equal lengths and thicknesses. The object then is to bring them to an equal degree of tension, by which the tones may be of the same pitch. The persons employed at this avocation are such as are able, from their training, to determine musical intervals with much precision. In our concluding cut the 'cabinet' pianoforte is reproduced.
sented as undergoing the process of tuning. We may here remark that the 'regulation' involves something more than the determination of the musical intervals between the several tones: it relates also to the easy and proper action of the keys, and the general fitness of all the parts for the office which they are to serve.

A portion of pianoforte mechanism to which we have not yet alluded is that connected with the *pedals*, resembling all the other portions in the high degree of care necessary in the manufacture. These pedals serve two totally distinct offices, one of which relates to all kinds of pianofortes, and the other to those only which are provided with three strings to every note. The first govern the 'dampers,' and their use may be thus explained. In order that the harmonies in a piece of music may produce their due effect, it is necessary that the preceding notes should not continue to sound long after the keys have been struck, else discord may usurp the place of harmony. For instance, if the note c were sounded, and the next note of the piece of music were c, the continued sounding of the c after the p has been struck would give the discordant interval of a 2nd, which the ear cannot tolerate, except as a foil to more perfect intervals. Hence mechanism is provided, whereby a soft hammer or 'dampener' is made to fall on the vibrating string directly the finger is removed from the key, and this damping smoothes the note by stopping the vibrations. As, however, it is desirable in some pieces of music to have the full effect of the vibrating strings after the fingers are removed from the keys, the player is enabled, by pressing his foot on a pedal, to remove all the 'dampers' to which they do not again come in contact until the pedal is released. In some of the older square pianofortes this adjustment is made by means of a handle situated near the left hand of the player; but we believe that in all the modern instruments a pedal affords the requisite leverage. The other kind of pedal, used only in grand pianofortes, is employed for the purpose of removing one out of every three strings from the action of the hammers. If three strings were struck by every hammer every time that the key belonging to that hammer is played upon, the player could not obtain the *piano* passages which add so much to the grace and beauty of music. The mechanism is, therefore, a provision for lessening the quantity of sound—for such is in reality the operation—by lessening the number of strings struck by each hammer. This is effected by shifting the entire key-board to a small distance from its usual position, whereby each hammer clears one of the three strings, and only strikes the other two. The foot-pedal effects this shifting by intermediate levers, and the player has thus the whole arrangement within his power.

Among the minor operations in the manufacture is the preparation of fret-work or open-cut boards for the front of some kinds of pianofortes. This is effected in a very quick and elegant way. The device being marked on the board with chalk, the board is fixed vertically in a kind of vice, and, as represented in the annexed cut, is sawn by means of an extremely fine and thin saw, which follows all the turnings and windings of the chalk-marks, penetrating to every angle, however acute, and severing the small pieces, the absence of which constitutes the pattern. The operation is a most delicate one, without any particular notice, as involving no principle but that which distinguishes common cabinet-work. We may, however, notice that the turned legs for the better kinds of instruments are produced by a beautiful lathe, the action of which is of a highly scientific order. An hexagonal or octagonal pattern is produced in a circular leg, by allowing the leg to remain stationary, and making the cutting tool revolve rapidly at such a distance from it as to cut away one-sixth or one-eighth of the surface. The cutting tool has at the same time a motion backward and forward in the direction of the length of the leg. The principle of action very much resembles that of the wheel-cutting engine described in our last supplement.

When the various component parts of the pianofortes are put together, the tones regulated to something like accuracy, the exterior adorned with polishing, carved ornaments, &c., and all rendered nearly complete, they are conveyed to another establishment belonging to the same firm in the neighbourhood of Golden Square. Before we follow them to this last depository, we will mention a circumstance which struck us during the visit to the factory at the Horseferry Road, and which is worthy of notice; we mean the precautions taken to prevent fire. Wherever large quantities of dry wood are used, such precautions are highly necessary; but we seldom remember to have seen them carried out on such a complete system. In many parts of the factory brick party-walls are carried from front to back, and across the opening which connects one department with another is a sliding iron door, carefully closed every night; so that the connection is entirely cut off from one to another. For the use of the workmen who have to melt glue, &c., there are about fifty large German stoves: these are each entirely surrounded by a high iron fender, which rests on stone or brick-work, separated by sheet-lead from the wooden floor beneath; so that the heat from the stove is most effectually cut off from the floor beneath, and, being close stoves, no sparks can fly about. For the process of veneering, and others wherein an open fire is required, large fire-places, about thirty in number, are provided: these are surrounded by and based on brick; and in the front of each is a heavy sliding iron door, working vertically in grooves and balanced by weights. The door can be lowered in an instant, whereby the fire is not only completely shut out from communication with the shop, but, being deprived of draught, must necessarily decline. Each fire-place is for the use of a certain number of men, all of whom take by turns the office of seeing that a bucket of water stands by the side of the fire-place, and of closing the iron door on leaving work. The superintending foreman visits all parts of the factory every evening after the men have left, and if any one of the sliding doors is seen open, the man whose
turn it was to attend to it is subjected to a fine. If, notwithstanding these precautions, a fire should break out, a fire-engine, a coil of leathern pipe, a plug connected with the water-main, and other mechanism of a similar kind, are at hand, and can be brought to bear upon any part of the factory at a few minutes' notice. These are arrangements which we should be glad to see adopted in every well-ordered factory.

The music-vans which bear the name of "Broadwood" are employed not only to convey pianofortes to the houses of the purchasers, but to convey them in the first instance from the factory in the Horseferry Road to Great Pulteney Street, Golden Square, where is the original establishment belonging to the firm. Before the great extension in the use of the pianoforte, the operations of the firm were wholly carried on in Pulteney Street and in a range of buildings extending from thence to Golden Square; but now, although there are here upwards of a hundred and fifty persons employed, the pianofortes are principally made at the factory which we have just left. The stock of instruments required to be kept on hand is so extremely large, that a wide range of wait-room is necessary. Almost every room in two large houses in Pulteney Street and one in Golden Square is occupied either in this way, or else by tuners who are giving the final regulation to the tones of the instruments: this adjustment cannot be effected in a large room where many are similarly employed, on account of the confusion of sound which would result; and there are therefore seldom more than two tuners in one room. Some of the apartments are store-rooms for 'grand' pianofortes, some for 'cabinet,' some for 'cottage,' some for 'semi-grand,' some for 'square;' others are for second-hand instruments; a large range of workshops is principally occupied by workmen engaged in 'grands,' the internal mechanism of which is prepared here; others are repairing and adjusting stock pianofortes, many hundreds of which are kept ready for hire. On the ground-floor are ranges of counting-houses and offices, for the cashier, clerks, collectors, &c., belonging to the establishment; in one of which we noticed a portrait, by Hogarth, of the original proprietor of the establishment, a picture which has probably occupied its present place for more than a century.

The pianoforte manufacture is one in which nothing but highly-skilled manual dexterity can make and adjust the numerous pieces of mechanism involved in it; and those workmen who possess this skill are not likely to be supplanted by any automatic machinery. Hence it happens that the same workmen are seen year after year, occupying their old benches, using their old tools, coming to work and leaving work at the old hours, and seeming as if the old shop belonged to them and they to the shop. We noticed, not only that many of the workmen in the factory are elderly men who have occupied their present situations twenty, thirty, or forty years, but that a kindly feeling prevailed among all, illustrative of mutual confidence between the employers and the employed. The patriarch of the establishment is a venerable citizen, foreman, not far from ninety years of age, who has seen out two or three generations of workmen, and whose connection with the establishment dates back through a period of nearly sixty years. That such a man is respected by the firm, and deemed almost part and parcel of it, need hardly be said.

In conclusion we have to thank the proprietors, and the heads of the several departments, for their obliging communications in reference to the subject of the present article.

![The 'Action' or Internal Mechanism of a Cabinet Pianoforte.]
THE PENNY MAGAZINE.

FROISSART AND HIS CHRONICLE.

No. III.

THE SIEGE OF CALAIS.

Only five days after the battle of Cressy, the people of Calais beheld the conqueror before their town, and a siege commenced, almost unexampled for its severity and the length of time it continued. The place might be considered as impregnable to direct assault, and the defenders were prepared to resist to the last. Edward, therefore, determined to surround the city so completely, that neither ingress nor egress should take place, and leave the rest to time and famine. His fleet blocked the harbour, and stopped approach that way; whilst on the land he formed vast intrenchments. For the accommodation of his soldiers he built an immense number of wooden huts or houses, which the French called the 'city of wood.' The brave governor of Calais, John de Vienne, understood clearly the purpose of all this, and immediately took such precautions as he deemed necessary. The nature of one of his precautions gives us a fearful illustration of the calamities of war. Seventeen hundred poor persons of the town, "useless mouths," as they were called, were driven out towards the English lines. Edward was then in one of his better moods; he gave them all a good dinner, twopence in money each, and then dismissed them to take their several ways into the interior. A second experiment of the same kind was thought to be too much. Provisions having become exceedingly scarce, a new survey of the place was made, when five hundred more unfortunates were determined to be "useless mouths," and dismissed as before. It is dreadful to reflect upon their fate. They were driven back at the sword's point by the English soldiers, and as John de Vienne would not re-admit them, they are said to have all perished in the sight of their own townspeople. Strenuous exertions were made from time to time to relieve the place from the sea, and a few vessels did get in by stealth, but afterwards ingenuity and strength became alike unavailable. The garrison then wrote to their king, Philip, to say they had eaten their horses, their dogs, and all the unclean animals they could find, and nothing remained but to eat each other. The letter fell into the hands of the English, and gave them a new motive for watchfulness, if any were needed, as it now became evident Calais must
yield soon, or be relieved. Philip, however, knew the condition of the place, and resolved to make one great effort in its favour. The Oriflamme, the sacred banner of the kingdom, that banner which was never to be used but on extraordinary occasions, was unfurled, and the vassals of the crown were summoned from every part to its support. In July, 1347, or eleven months after the commencement of the siege, the failing hearts of the garrison were inspired with new energies by the sight of the godly array, in the distance, of their sovereign army. How were they to be disappointed by Philip, finding both in the town so strongly guarded that he could only force his way by a very bold and costly attack, adopted an amusing expedient. He sent four of his principal lords to the English king, to complain that he was there to do battle, but could find no way to come to him, and therefore requested a meeting of council to advise a place. The nature of the answer may be readily imagined. And what did Philip then for the brave soldiers and citizens who had done everything for him?—turned round and re-traced the road he had come. All the sufferings the defenders of Calais had experienced must have been light compared to the bitterness of their feelings as they saw the gradual disappearance of the army which had come over the sea to strike with a single blow. Such is the position of affairs at the moment Froissart commences the relation of an incident which has made the siege of Calais a memorable event throughout the civilised world, and shed a lustre over it which appears only the more permanently brilliant in contrast with the factitious glare of mere military glory by which it is surrounded.

"After that the French king was thus departed from Sangatte, they within Calais saw well how their succour failed them, for the which they were in great sorrow. Then they desired so much their captain, Sir John of Vienne, that he went to the walls of the town, and made a sign to speak with some person of the host. When the king heard thereof, he sent thither Sir Walter of Manny and Sir Basset; then Sir John of Vienne said to them, 'Sirs, ye be right valiant knights in deeds of arms, and ye know well how the king my master hath sent me and others to this town, and commanded us to keep it to his behoof, in such wise that we take no blame, nor to him no damage; but if ye suffer it to fail ever for any part, ye shall have it to be made good by the king's grace. Now our succours hath failed us, and we be so sore strained, that we have not to live withall, but that we must all die, or else enrage for famine, without the noble and gentle king of yours will take mercy on us, and to let us go and depart as we be, and let him take the town and castle and all the goods that be therein, the which is great abundance.' Then Sir Walter of Manny said, 'Sirs, we know somewhat of the intention of the king our master, for he hath shewed it unto us; surely know we for truth it is not his mind that ye nor they within the town should depart so, for it is his will that ye all should put yourselves into his pure will to ransom all such pleaseth him, and to put to death such as he list; for they of Calais hath done him such contrarys and despitys, and hath caused him to dispend so much goods and lost many of his men, that he is sore grieved against them.' Then the captain said, 'Sirs, this is too hard a matter to us; we are here within, a small sort (company) of knights and squires, who have truly served the king our master, as well as ye like can, and have been within the town with much pain and unease; but we shall yet endure as much pain as ever knights did, rather than to consent that the worst lad in the town should have any more evil than the greatest of us all; therefore, sirs, we pray you that of your humility, yet that ye will go and speak to the king of England, and desire him to have pity of us, for we trust in him so much gentleness, that by the grace of God, his purpose shall change.' Sir Walter of Manny and Sir Basset, returned to the king, and declared to him all as they were, and what the king said he would none otherwise, but that they should yield them up simply to his pleasure. Then Sir Walter said, 'Sirs, saving your displeasure in this, ye may be in the wrong, for ye shall give by this an evil example: if ye send any of us your servants into any fortress, we will not be very glad to go if ye put us there at the will of them in the town to death after they be yielded; for in likewise they will deal with us if the case fell like; the which words divers other lords that were there present sustained and maintained. Then the king said, 'Sirs, I will not be alone against you; therefore, Sir Walter of Manny, ye shall go and say to the captain, that all the grace that he shall find now in me, is, that the let me of the town come out bare-headed, bare-footed, and bare-legged, and in their shirts, with halters about their hands, and let them six yield themselves purely to my will, and the residue I will take to mercy,' Then Sir Walter returned, and found Sir John of Vienne still on the walls of the town, abiding of an answer; then Sir Walter showed him all the grace that he could get of the king. 'Well,' quoth Sir John, 'Sirs, I require you harry here a certain space till I go into the town and show this to the commons of the town, who sent me thither.' Then Sir John went into the market-place and sounded the common bell; then incontinent men and women assembled to him, and he showed them a report of all that he had done, and said, 'Sirs, it will be none otherwise, therefore take advice and make a short answer.' Then all the people began to weep and make such sorrow, that there was not so hard a heart, if they had seen them, but that would have had great pity of them: the captain himself wept piteously. At last the most rich burgesses of all the town, called Eustace de St. Pierre, rose up and said openly, 'Ifsirs, great and small, great mischief it should be to suffer to die such people as be in this town, either by famine or otherwise, when there is a mean to save them. I think he or they should have great merit of our Lord God that might keep them from such mischief. As for myself, I have so good trust in our Lord God, that if I die in the quarrel to save the town, I know that God would pardon me; wherefore, to save them, I will be the first to put my life in jeopardy.' When he had thus said, every man worshipped him, and divers kneeled down at his feet with sore weeping and sore sighs. Then another honest burgess rose and said, 'I will keep company with my gossip Eustace,' he was called Jean D'Aire, and so rose up Jacques de Wisant, who was rich in goods and heritage; he said also that he would hold company with his two cousins in likewise; so did Peter of Wisant, his brother; and then rose two other; they said they would do the same. Then they went and appareled them as the kind desired. Then the captain went with them to the gate; there was great lamentation made of men, women, and children, at their departing. Then the gate was opened, and he issued out with the six burgesses, and closed the gate again; so they were between the gate and the barriers. Then he said to Sir Walter of Manny, 'Sir, I deliver here to you as captain of Calais, by the whole consent of all the people of the town, six rich men, and have your authority that they be, and were to-day, most honourable, rich, and most notable burgesses of all the town of Calais; wherefore, gentle knight, I require you pray the king to have mercy on them, that die not.' Quoth Sir Walter, 'I cannot say what the king will do, but I shall
do for them the best I can.' Then the barriers were opened, the burgesses went towards the king, and the captain entered again into the town. When Sir Walter presented these burgesses to the king, they knelt down, and held up their hands and said, 'Noble king, be here six, who were burgesses of Calais and great merchants; we have brought the keys of the town and of the castle, and we submit ourselves clearly into your will and pleasure, to save the residue of the people of Calais who have suffered great pain. Sir, we beseech your grace to have mercy and pity on us through your high nobles.'

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Sound, a fine expanse of water, hastwoopenings

to the hold, which was capable of containing sixteen such trucks, laden with eighty tons of stone. The vessel, with stones, trucks, and all, then proceeded to the breakwater; each truck was wheeled to the opening in its turn, overset by a piece of machinery at the end of the vessel, and the stones precipitated into the sea. A cargo of eighty tons of stone was thus discharged in less than an hour. The first stone was set in the sea on August 7, 1812, and deposited in the sea a few days afterwards. The number and mass of the stones required to be deposited in this way may be conceived

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The measures required for the prosecution of the undertaking had relation to the purchasing of the stone, the quarrying and conveyance to the sea-shore, the transfer to the spot where the breakwater was to be formed, and the deposition in the sea. In the first place the quarries in the neighbourhood of Plymouth were searched with the greatest care, and made the stone to be taken from their necks, and caused them to be new clothed, and gave them theirdinnerat theirIt was found that some limestone hills near the Cat water were capable of affording twenty millions of tons of stone, very much more than would be required, and that the stone could be easily conveyed to the shores of the Plym, which flows into the Cat water. This quarry was purchased of the Duke of Bedford for 10,000£.

Quays were then constructed for loading the ships with stone; iron railways were laid down from the quarry to the quays; and machinery was erected for expediting all the processes.

The vessels employed for conveying the stones from the quarries to the site of the breakwater were of peculiar construction: they had two openings, each capable of receiving a truck laden with a stone weighing four or five tons; and from these openings iron railways were laid along the vessel. A truck with its load was wheeled down from the quarry to the quay, thence across the quay to the opening in the vessel, and thence to the hold, which was capable of containing sixteen such trucks, laden with eighty tons of stone. The vessel, with stones, trucks, and all, then proceeded to the breakwater; each truck was wheeled to the opening in its turn, overset by a piece of machinery at the end of the vessel, and the stones precipitated into the sea. A cargo of eighty tons of stone was thus discharged in less than an hour.

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Plymouth Sound, unlike Portsmouth Harbour, is very much exposed to the sea. These great naval arsenals require, not only a dockyard for building ships, and a harbour where ships may lie up in ordinary in safety, but also a sound, or capacious expanse of water, wherein ships may assemble before and after a foreign expedition. Portsmouth possesses all these three in its dockyard, its harbour, and Spithead; but Plymouth, until late years, although it had a dockyard and the excellent haven of Hamoaze, had not a safe place of rendezvous analogous to Spithead. Plymouth Sound, a fine expanse of water, has two openings northward, one into the Hamoaze, and the other into the Catwater; and the ships in these two, as well as in the Sound itself, were formerly so much incommoded by the heavy swell which almost constantly rolled in, especially when the wind blew from the west, that it was found necessary to make some sort of barrier. Mr. Rennie, the engineer, and Mr. Whidby, the master-attendant at Woolwich dockyard, were sent down to Plymouth in the year 1806, to devise the best means of effecting this object. Several plans were offered to the notice of Government; one of which was put on the market; the building a pier attached to the mainland at one end and to an insular rock at the other. But certain considerations relative to the effects which this mode of construction might have on the flux and reflux of the tide, or the deposition of mud, and of blocking up one out of the only two good channels by which ships could enter the Sound, led to the abandonment of all. Then the king called upon Messrs. Rennie and Whidby, and ultimately adopted, to procure an immense quantity of large stones, and to send them into the Sound, until a barrier or dyke a mile in length should be raised above the surface of the water, and stretching across the Sound so as to leave entrances at both ends. Parliament voted the required sums, and operations commenced six years after the survey of the Sound.

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by attending to the proposed size of the breakwater. It is a straight line one thousand yards in length, with flanks or returns inclining inwards at each end to a distance of three hundred and fifty yards each, thus making the whole length very little short of a mile. In order that the stones should not roll or fall over each other, it was necessary to make the slopes of the sides very great. It is thirty feet wide at top when carried ten feet above low-water mark, and of such width at the bottom, that the outer slope should be fourteen feet above low-water mark. The projected quantity of stone has been estimated at nearly forty million cubic feet.

In March, 1813, one portion of the breakwater made its appearance above low-water mark. About fifty vessels were employed in carrying out the stones; by which, in the year 1812, were deposited about 16,000 tons of stone; in 1813, 71,000; in 1814, 240,000; in 1815, 264,000; in 1816, 300,000. The greatest part of the stones were under one ton each; most of the others varied from one to five tons; and a few exceeded the latter amount. Every ton of stone cost, on an average, 2s. 5d. for quarrying, 1s. 10d. for transport, and 3s. 7d. for all other expenses attendant on the undertaking.

Baron Dupin was in England at the time of these operations, and in his notes he speaks enthusiastically of the impression made on his mind by what he saw. He speaks of "the order, regularity, and activity which reign throughout all the operations; the embarking and disembarking of the materials; the working and placing of the enormous blocks which form the upper part of the breakwater; and which, in the union of exertion and dexterity, combines the labour of the workmen; the transport of the blocks, and, above all, their extraction from the quarries. When we visit the workshops of the artificers and the operations of the quarry-men," he continues, "it is admirable to observe man, so weak and so feeble, manage at his will the enormous masses he has detached from their beds, in order to precipitate them into the ocean, to form other hills. The rods are formed and bound in the air for the transport of the useless earth and broken fragments; the lines of cranes and their combined labour; the movements of the carriages; the arrival, the loading, and the departure of the vessels—present to the eye of an admirer of great works and of the mechanical arts, one of the most pleasing and imposing connected events of contemplation."

Various minor changes were made from time to time in the original plan; and down to our own day, erections of some kind or other have been carrying on in connection either with the breakwater or with arrangements at its extremities for victualling and watering ships. Mr. Stuart of Plymouth made the following communication last autumn to the British Association, in relation to a rumour concerning the breakwater:

"In consequence of a communication made in July, 1838, to the naval authorities at this port, to the effect that a deposit was then going on in the Sound, the Admiralty directed Mr. James Walker to report fully on the subject, and the best means for providing against the apprehended injury to the anchorage. After a long and minute investigation, and after much survey, during which no less than two thousand soundings were taken, Mr. Walker reported that, taking the mean of the soundings that could be affected by the breakwater, the result was that there was but very little increase or decrease, and that if there was any increase in the Sound (except close to the breakwater, and which could produce no practical evil) it was only small, certainly not enough to cause alarm, or to justify expensive measures for removing the cause."

Floating Breakwater.—A proposed barrier under this name, which is now obtaining a portion of the public attention, we mention, not with a view to offer any opinion as to its merits, but to give some degree of completeness to our sketch of breakwaters generally.

About three or four years ago Captain Tayler took out a patent for the contrivance here alluded to, the practical application of which has, we believe, since been undertaken by a joint-stock company. The breakwater consists of a floating frame-work, or barrier, consisting of timbers and masonry, and is expected to act in the following manner:—that by yielding to the violence of the sea, and at the same time by admitting the water to pass under, over, and through it, it will divide and break the waves, thereby reducing them to a harmless state. Captain Tayler, in the specification of his patent, describes a floating caisson or breakwater composed entirely of red-pine timber, so arranged that when once the work is completed, each caisson is kept in its place by a mooring-chain or rod. This chain is a curious part of the arrangement, for it consists of a succession of wooden rods, about twelve feet long and nine inches wide, shackled together by the links of a common mooring-chain. These wooden rods are not intended to extend the whole distance from the caisson to the ground, but to occupy the middle portion, having a piece of common chain at each end; and the motive for using them at all is to avoid the great weight and expense of iron chains strong enough to retain the caissons against the action of a rough sea. The rods are formed and bound in such a manner as to increase the natural longitudinal strength of the wood.

In practice, it is proposed to place these caissons end to end, or to dispose them in a semicircular form, according to the nature of the harbour where they are to be used.

Unpopular Improvements.—There is not one single source of human happiness against which there have not been uttered the most lugubrious predictions. Turnpike roads, navigable canals, inoculation, hops, tobacco, reformation, and revolution. There are always a set of worthy and moderately gifted men who bawl out death and ruin upon every valuable change which the varying aspect of human affairs absolutely and imperiously requires. It would be extremely useful to make a collection of the hatred and abuse that all those changes have experienced, which are now admitted to be market improvements in our condition. Such a history might make folly a little more modest, and suspicious of its own decisions.—Sydney Smith.

Right of Property in Wind.—Water-mills were at one time, particularly on the Continent, included among the regalia or rights of the crown; and on the introduction of windmills, this assumed right was extended over air as well as water. A whimsical instance of the attempted exercise of this privilege is on record. It seems that the Augustinian monks belonging to the monastery at Weinsheim, in the province of Overossel, were desirous of erecting a windmill in the neighbourhood; but the lord of the soil opposed their project, on the extraordinary assumption that the wind in that district beloned to him. Upon this the monks applied to the Bishop of Utrecht, who decided, in a towering passion, that no one had power over the wind in his diocese but himself. And thereupon he immediately granted letters-patent to the good monks.—Guide to Trade—The Miller.
STRAWBERRY HILL.

"[Abridged from 'London."

There never was a place so associated with the memory of one man as Strawberry Hill is with Horace Walpole. There is nothing to confuse us in the recollection. We are not embarrassed with the various branches of the genealogical tree. Horace the first or Horace the second, Horace the great or Horace the little, do not jostle in our memories. Imagination has no great room to play; with a catalogue in hand, and a porter watching that no trinkets are stolen, and a mob of people about us, who "admire a lobster or a cabbage in a market-piece, dispute whether the last room was green or purple, and then hurry to the inn for fear the fish should be overdressed." Even as the author of 'The Castle of Otranto' saw the portrait all in white of Lord Deputy Falkland walk out of its frame in the great gallery at Strawberry Hill, so if Mr. Robins had permitted us to wander about the house in the cold twilight, we should most assuredly have seen a dapper little gentleman in embroidered velvet, who would have told us something new worth communicating to our readers.

As it is, we must be content without any revelations from Strawberry Hill. The world ought to be content: it possesses some three thousand closely-printed pages of private history, gossiped over and committed to paper in great part within those walls. Strawberry Hill has a wonderful resemblance to 'The House of Tidings' of Chaucer; and that house "Ne half so quaintly was ywrought."

Like each other—
"All —although.

But the uses of the poetical and prosaic 'House of Tidings' were identical.

"And by day in every tide
Be all the doors open wide;

\[80x100\]"Al" — although.

\[62x44\]"Rownings — mutterings.

\[334x49\]"Leasings — lyings.

\[275x49\]"Drede — doubt.

[View from the Garden of Strawberry Hill.]

Chaucer's house was for all time; but it has left very few minute records: Strawberry Hill has reference to a fraction of existence; but for half a century it can boast of the most delightful historiographer of the London world of fashion—a noisy, busy, glittering world at all periods, but in Walpole's pages something more amusing than the respectable monotony of the same world in our better days of prudence and decorum.

The letters of Horace Walpole cannot at all be regarded as a picture of society in general. He has no distinct notion whatever of the habits of the middle classes. Society with him is divided into two great sections—the aristocracy and the mob. He was made
by his times, and this is one of the remarkable features of his times. With all his sympathy for literature, he has a tendency for authors that are out of the pale of fashion. Fielding, Johnson, Sterne, Goldsmith, the greatest names of his day, are with him ridiculous and contemptible. He cannot be regarded, therefore, as a representative of the literary classes of his times. As the son of a great minister he was petted and flattered till his father fell from his power; he says himself he has 'always been a little of a flatterer' till he found his equals in the political intrigues of the time, he displayed no talent for business or oratory. His feeble constitution compelled him to seek amusement, instead of dissipation; and his great amusement was to look upon the follies of his associates and to laugh at them. He was not at bottom an ill-natured man, or one without feeling. He affected that insensibility which is the exclusive privilege of high life—and long may it continue so. When Lord Mountford shot himself, and another Lord rejoiced that his friend's death would allow him to hire the best cook in England, the selfish indifference was probably more affected than real. Walpole takes off his own mask on one occasion. When he heard of Gray's death in writing to Pope he has a word or two to say for the concern he feels, and adds, 'I thought that what I had seen of the world had hardened my heart; but I find that it had formed my language, not extinguished my tenderness.' When he speaks of individuals, we may occasionally think the world had formed his language; he is too often spiteful and malicious; but when he describes a class, he is not likely much to exaggerate. The esprit de corps would render him somewhat charitable: if he did not 'ex- tumenate,' he would not set down 'in malice,' when he was holding up a mirror of himself and of the very people with whom he was corresponding.

The year 1741 presents to us a curious spectacle of the aristocracy and the people at issue, and almost in mortal enmity. It is upon the question of opera or oratorio against the operas, and succeeds. He has hired all the goddesses from farces, and the singers of Roast Beef from between the acts at both theatres, with a man with one note in his voice, and a girl without ever a one; and so they sing, and make brave hallelujahs; and the good company encore the recitative, if it happens to have any cadence like what they call a tune."† The Italian Opera-House in the Haymarket itself went out of fashion in a few years, and that insecurity had thereby courted hourly in Lincoln's Inn Fields. What the Court then patronised the aristocracy rejected. "The late royalties went to the Haymarket, when it was the fashion to frequent the other opera in Lincoln's Inn Fields. Lord Chesterfield one might come into the latter, and was asked if he had been at the other house? 'Yes,' said he, 'but there was nothing but the king and queen; and as I thought they might be talking business, I came away.'"‡ However, amidst all these feuds the Italian Opera became firmly established in London; and through that interchange of taste which fortunately neither the prejudices of exclusiveness nor ignorance can long prevent, the people began gradually to appreciate the Opera, and the opinion of Walpole became enthusiastic admirers of the Oratorio.

In the days of Walpole the Theatre was fashionable; and in their love of theatrical amusements the nobility did not affect to be exclusive. In not liking Garrick when he first came out, Walpole and his friend Gray indulged probably in the fastidiousness of individual taste; instead of representing the opinions of the fashionable or literary classes. Gray writes, "Did I tell you about Mr. Garrick, that the town are horn-mad after? There are a dozen dukes of a night at Goodman's Fields sometimes; and yet I am stiff in the opposition." Walpole, in May, 1742, six months after Garrick's first appearance, says, "All the run is now after Garrick, a wine-merchant, who is turned player, and has the son of a great minister he was petted and flattered. 'Handel stands,' says he, 'like bold Briareus, with a hundred hands; to stir, to rowe, to shake the soul he comes, and Jove's own thunders follow Mars' drums. Arrest him, empress, or you sleep no more—She heard, and drove him to the Hibernian shore.'† Handel came back to London in 1742, and the tide then turned in his favour. Horace Walpole shows us how fashion tried to sneer him down: he is himself the oracle of the divinity. 'Handel has set up an oratorio against the operas, and succeeds. He has hired all the goddesses from farces, and the singers of Roast Beef from between the acts at both theatres, with a man with one note in his voice, and a girl without ever a one; and so they sing, and make brave hallelujahs; and the good company encore the recitative, if it happens to have any cadence like what they call a tune.'† The Italian Opera-House in the Haymarket itself went out of fashion in a few years, and that insecurity had thereby courted hourly in Lincoln's Inn Fields. What the Court then patronised the aristocracy rejected. "The late royalties went to the Haymarket, when it was the fashion to frequent the other opera in Lincoln's Inn Fields. Lord Chesterfield one might come into the latter, and was asked if he had been at the other house? 'Yes,' said he, 'but there was nothing but the king and queen; and as I thought they might be talking business, I came away.'"‡ However, amidst all these feuds the Italian Opera became firmly established in London; and through that interexchange of taste which fortunately neither the prejudices of exclusiveness nor ignorance can long prevent, the people began gradually to appreciate the Opera, and the opinion of Walpole became enthusiastic admirers of the Oratorio.

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"On the Feuds about Handel and Bononcini."

"Strange, all this difference should be "Twixl Tweedle-Dum and Tweedle-Dee."

Walpole naturally belongs to the party of his "order." Handel had produced his great work, the 'Messiah,' in 1741, at Covent Garden. Fashion was against him, though he was supported by the court, the mob, and the poet of common sense. He went to Ireland; and the triumph of the Italian faction was thus immortalized by Pope:—

"Lo! giant Handel stands, Like bold Briareus, with a hundred hands; To stir, to rowe, to shake the soul he comes, And Jove's own thunders follow Mars' drums. Arrest him, empress, or you sleep no more— She heard, and drove him to the Hibernian shore."†

Handel came back to London in 1742, and the tide then turned in his favour. Horace Walpole shows us how fashion tried to sneer him down: he is himself the oracle of the divinity. 'Handel has set up an oratorio against the operas, and succeeds. He has hired all the goddesses from farces, and the singers of Roast Beef from between the acts at both theatres, with a man with one note in his voice, and a girl without ever a one; and so they sing, and make brave hallelujahs; and the good company encore the recitative, if it happens to have any cadence like what they call a tune.'† The Italian Opera-House in the Haymarket itself went out of fashion in a few years, and that insecurity had thereby courted hourly in Lincoln's Inn Fields. What the Court then patronised the aristocracy rejected. "The late royalties went to the Haymarket, when it was the fashion to frequent the other opera in Lincoln's Inn Fields. Lord Chesterfield one might come into the latter, and was asked if he had been at the other house? 'Yes,' said he, 'but there was nothing but the king and queen; and as I thought they might be talking business, I came away.'"‡ However, amidst all these feuds the Italian Opera became firmly established in London; and through that interchanging of taste which fortunately neither the prejudices of exclusiveness nor ignorance can long prevent, the people began gradually to appreciate the Opera, and the opinion of Walpole became enthusiastic admirers of the Oratorio.

In the days of Walpole the Theatre was fashionable; and in their love of theatrical amusements the nobility did not affect to be exclusive. In not liking Garrick when he first came out, Walpole and his friend Gray indulged probably in the fastidiousness of individual taste; instead of representing the opinions of the fashionable or literary classes. Gray writes, "Did I tell you about Mr. Garrick, that the town are horn-mad after? There are a dozen dukes of a night at Goodman's Fields sometimes; and yet I am stiff in the opposition." Walpole, in May, 1742, six months after Garrick's first appearance, says, "All the run is now after Garrick, a wine-merchant, who is turned player, and has the
to dabble with cards and dice, and he records his winnings with a very evident satisfaction. The reign of George White’s club meant a great deal, and the name on the forehead was Whist; and though Walpole voted it dull; “Whist has spread a universal opium over the whole nation.” Again: “The kingdom of the Dull is come upon earth. . . . The only token of this new kingdom is a woman riding on a beast, which is the mother of abominations, and the name on the forehead is Whist; and the four-and-twenty elders, and the woman, and the whole town, do nothing but play with this beast.”* Whist had a long reign. In 1749 Walpole writes: “As I passed over the green [Richmond], I saw Lord Bath, Lord Lonsdale, and half-a-dozen more of the White’s club, sauntering at the door of a house which they have taken there, and come to every Saturday and Sunday to play at whist. You will naturally ask why they can’t play at whist on London week days as well as on the other five. Indeed I can’t tell you, except that it is so established a fashion to go out of town at the end of the week, that people do go, though it be only into another town.”† Ministers of state, and princes who had something to do, were ready to relieve the cares of business by gambling, as much as other people gambled to get their money out. Some card-houses in London were once or twice a week to hunt with the Duke [Cumberland]; and as the latter has taken a turn of gaming, Sandwich, to make his court—and fortune—carries a box and dice in his pocket; and so they throw a main, whenever the hounds are at fault, “upon every green hill and under every green tree.”‡ Five years later, at a magnificent ball and supper at Bedford House, at the Duke was playing at hazard with a great heap of gold before him: somebody said he looked like the prodigal son and the fatted calf, both.”§

There was deep philosophy in a saying of George Selwyn’s, when a waiter at Arthur’s Club-House was taken up for robbery: “What a horrid idea he will give us to the people in Newgate! It may be done for the greater good, so that the people Newgate at that era had a much looser code of morals than some of the great folks they pillaged. The people of London got frightened about an earthquake in 1750, and again in 1756. There was a slight shock in the first of those years, which set the hauntings of White’s furiously betting whether it was an earth-quake or the blowing up of the powder-mills at Hounslow. Bishop Sherlock and Bishop Secker endeavoured to frighten the people into piety; but the visitors at Bedford House, who had supped and stayed late, went about the town knocking at doors, and bawling in the watchman’s note, “Past four o’clock and a dreadful earthquake.” Some of the fashionable set were abroad, however, and Lord Sandwich, and two or three days before the exact day on which the great earthquake was prophesied to happen, there was a crowd of coaches passing Hyde Park Corner with whole parties removing into the country. “Seven women have made earthquake gowns—that is, warm gowns to sit out of doors all to-night. These are of the most courageous. One woman is still more heroic, is come to town on purpose; she says all her friends are in London, and she will not survive them. But what will you think of Lady Catherine Pelham, Lady Frances Arundel, and Lord and Lady Galway, who go to play at whist till five in the morning, and then come back—I suppose to look for the bones of their husbands and families under the rubbish?”* When the rulers of the nation on such an occasion, or any other occasion of public terror, took a fit of hypocrisy and ordered a general fast, the gambling-houses were forced to be filled with card-players who had a day of leisure upon their hands. Indifference to public opinion, as well as a real insensibility, drew a line between the people of fashion and the middle classes.

The love of sights, the great characteristic of the vulgar of our own day, was emphatically the passion of the great in the last century. The plague was reported to be in a house in the City; and fashion went to look at the outside of the house, by which the plague was enshrined. Lady Milton and Lady Temple on a night in March put on hats and cloaks, and, sallying out by themselves to see Lord Macclesfield lie in state, “literally waited on the steps of the house in the thick of the mob, while one posse was admitted and let out again for a second to enter.” The “mob” (by which Walpole usually means an assembly of people of any station below the aristocracy) paid back this curiosity with interest.

In those days the great patron of executions was the fashionable George Selwyn; and this was the way he talked of such diversions:— “Some women were scolding him for going to see the execution of Lord Lovat,” and said “they would not see the head cut off?: Nay, says he, ‘if that was such a crime, I am sure I have made amends, for I went to see it sewed on again.”† When M’Lean, the highwayman, was under sentence of death in Newgate, he was a great attraction to the fashionable world. “Lord Mountford, at the head of half White’s, went the first day to see it. But the chief personages who have been to comfort and weep over this fallen hero are Lady Caroline Pethersham and Miss Ashe.”§ These were the heroines of the minced chickens at Vauxhall; and we presume they did not visit the condemned cell to metamorphose the thief into a saint, as is the ‘whim’ of our own times. The real robbers were as fashionable in 1750 as their trumpery histories were in 1840. “You can’t conceive how the rich young fellows were going to Newgate; and the prints that are published of the malefactors, and the memoirs of their lives and deaths set forth with as much parade as—as—Marshall Turenne’s—we have no generals worth making a parallel.”¶ The visitors had abundant opportunities for the display of their sympathy:— “It is shocking to think what a shambling this country is grown! Seventeen were executed this morning.”¶¶ Amidst such excitement, who can wonder that a man of talent and taste, as Walpole was, should often prefer pasting prints into a portfolio, or correcting proofs at “poor little Strawberry?”

Of the house itself there is little to be said. Its chief importance arises from its being the first attempt to revive Gothic architecture in domestic buildings; but it is only a collection of parts imitated from divers originals, built in portions during an interval of twenty-three years, from 1733 to 1776. The ceiling of the china-room is painted in imitation of one in the little Borghese Villa at Frescati; while in the little parlour the chimney is taken from the tomb of Thomas

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* Horace Walpole to Mann, April 2, 1750.
† Horace Walpole to Lord Herford, March 27, 1764.
‡ Horace Walpole to Conway, April 16, 1747.
§ Horace Walpole to Mann, August 2, 1750.
¶ Horace Walpole to Mann, October 18, 1750.
¶¶ Horace Walpole to Mann, March 23, 1752.
Ruthall, Bishop of Durham, in Westminster Abbey; and in the library "the books are arranged within Gothic arches of pierced work, taken from a side door-case to the choir in Dugdale's St. Paul's. The doors themselves were designed by Mr. Chute. The chimney-piece is imitated from the tomb of John of Eltham, Duke of Cornwall, in Westminster Abbey; the stonework from that of Thomas, Duke of Clarence, at Canterbury." The collection partakes of the same mixed character. With some truly valuable pictures and rarities of great value, there are a vast variety of merely knick-knacks—"two mustard-pots and plates of Sèvres china—an old blue and white plate with a rib in the middle."* Collecting of old china was then a passion, and the whole assemblage forms a curious example of the influence of the age upon the taste of the individual. After a slumber of many years, this collection, preserved by the provisions of his will, is about to be dispersed, and the fame of Walpole will rest upon the sure foundation of his epistolar excellence, when he batters the battlements and towers of Strawberry Hill are levelled with the dust, and the remembrance of his indefatigable labours in erecting so fragile a monument to himself will only excite a smile.

* Walpole's own Catalogue.

Food of Birds.—Those birds which we denominate as rapacious, such as falcons, hawks, owls, live upon animal food which they capture, kill, and devour; abstaining, unless stimulated by necessity, from creatures they may find dead. Then come the pies: of these, the raven and crow likewise eat animal food, but it is generally such as has been killed by violence or ceased to exist, only in cases of want killing for themselves. The rock, the daw, the magpie, consume worms, grubs, and are not addicted, except from hunger, to eating other animal matters. The two first eat at times in society; the latter associates with neither, but feeds in places remote from such as are frequented by them. The Jay too eats grubs and such things, but seeks them out under hedges, in covert and places which others of his kind abandon to him. The cuckoo seems principally to live upon the eggs of birds, with a few insects and larvae occasionally; the wryneck upon emmets, from heaps under hedges near concealment—the woodpeckers upon insects found upon trees; and when they seek for the emmet, they prefer the ant-heaps of common and open places; the halcyon upon small fishes:—thus all these creatures, even when they require similar aliment, diet at their separate boards. Of the Gallinaceous birds, the wood-grouse is supported by the young shoots of the pine in his forests; but the black and red grouse live upon berries found on the moor, the seeds and tops of the heath; the partridge upon seeds in the field, blades of grass or of corn; the pheasant upon mast, acorns, berries from the hedge or the brake. The bastard is content to live upon worms alone, found in early morning upon downs and wide-extended plains, where none dispute his right or compete with him, but one species of plover. The doves make their principal meals in open fields, upon green herbage and seeds. The star again feeds upon worms and insects, but in places remote from the bastard, nor does he content with the rock or the daw, but takes his meat and is away. The Passarine birds, indeed, are remarkably dissimilar in their manner of feeding. The missel-thrush will have berries from the misseltoe, or seeks for insects and slugs in wild and open places, the heath or the down. The song-thrush makes his meal from the snail on the bank, or worm from the paddock; but the blackbird, though associating with him, leaves the snails, contenting himself with worms from the hedge-side, or berries from the briar or the bush. The fieldfare consumes worms in the mead or haws from the hedge. The cross-bill will have seeds from the apple, or cone of the fir—the greenfinch, seeds from the uplands, or door of barn, or rickyard. The hunting is peculiarly gritty with a bony knob in the roof of his bill, upon which he breaks down the hard seeds he is destined to feed upon. The bullfinch selects buds from trees and bushes. The goldfinch is nurtured by thistle-seeds, or those of other syngenesious plants. Sparrows feed promiscuously. Linnets self out seeds from the cherlock, or the rape, or the furze on the common. One lark will feed in the corn-field, another in the mead, another in the woodlands—one flock upon insects frequenting the alder and willow; some upon those which are hidden under mosses, and lichens on large trees; a third upon coleopterous creatures, secreted in the hedge-row and the coppice. The grey wagtail finds food with us all the year; but the yellow one must seek it in other regions. The nightingale feeds upon a peculiar grub, and when that is not found in the state he prefers, he departs. The domestic swallow feeds round our houses, or in the meadow; but the bank swallow never comes near us, chases his food beneath the crag, and along the stream. The swift prefers the higher ranges of the air, dieting upon the flies that mount into those regions. The goatsucker does not notice the creatures of the day, capturing the moths and dros of the night. The wheatear feeds only upon such insects as he finds upon fallow lands, the down or the heath. And thus almost every individual might be characterized by some propensity of appetite, in some mode or place of feeding; and hence individuals are found as tenants of the homestead, the wild, the stream, the air, rock, down, and grove—in every place finding plenty, and fulfilling their destination without rivalry or contention; nor perhaps is there any race of creatures that associates more innocently, or passes their lives more free from bickering and strife, than these our land-birds do, persevering, from period to period, with undeviating habits and propensities, manifesting an original appointment and fixed design of Providence, whose bounteous table, wherever we look around, is spread for all, and good things meted out to each by justice, weight, and measure.—Journal of a Naturalist.
THE WILLOW.

If a person who has never been in the habit of bestowing more than a passing and general glance at trees were to set about classifying the willow genus, he would, from the casual recollection of things which meet the eye and are not accurately observed, probably not get much beyond three subdivisions. He has seen the common willow on the banks of river or canal, with its rough bark and pollarded top, its leaves ruffled by the breeze and turning up their white under-surface; and in little garths by the river side, where the soil is moist, but not saturated, or on small river islands, he has noticed the long wand-like shoots of the osier; and the beauty of the weeping willow, drooping gracefully over the margin of river, artificial lake, or basin into which a fountain pours its waters, or waving its delicate and pensile branches over the lawn has certainly attracted his admiration. Here then are three distinct varieties, the common willow for timber, the osier for basket-work, and the weeping willow for ornament; to which may be added that which produces the well-known yellow blossoms called ‘palms,’ and some parts of the country ‘goslings,’ and which appear very early in the spring. These blossoms are gathered on Palm Sunday, in commemoration of Christ’s entry into Jerusalem. The bright yellow hues of the golden willow may also perhaps have been noticed as another species; making five varieties altogether. The inquisitive observer of trees, when he is told that there are above two hundred varieties of willow growing in England, will regard them with more interest, and perhaps derive some gratification in learning the differences which exist in a family connected by affinities and external features with which every one is familiar.

A satisfactory botanical arrangement of the willow genus has not even yet been completely effected, though more pain has been bestowed on it than on any other genera. The willow grows naturally in places where moisture exists, and does not thrive in a dry soil, unless its roots are within reach of water. It therefore is not adapted for a wide range of situations; and when

[Common White Willow—Salix Alba. Winter Aspect—From a Specimen in Vanbrugh Fields, near Charlton, Kent.]
removed from those best suited to its nature, corresponding changes take place in its appearance and habits. It does not blossom until summer, instead of in early spring; or the contrary effect may be produced if it has been removed from the mountains to the warmth of the plains. But making allowance for effects produced by such causes, the number of species growing in spots where their natural characteristics are freely developed exceeds two hundred, as already stated. At Woburn Abbey, the seat of the Duke of Bedford, there is a Salizetum, in which all the known species of willows and osiers is cultivated, which was founded for the purpose of enabling the botanist to study the genus. In 1829 the late Duke printed, for private circulation, a work entitled ‘Salizetum Woburnense,’ in which one hundred and sixty willows are figured and described. Similar works have been published both in this country and on the Continent, and the difficulties which botanists formerly experienced in all that related to the genus have gradually been diminished, though they are not entirely conquered. Linneus, when he directed his attention to this subject, was of opinion that it was necessary to begin afresh, and that a new description of the several species of willow was one of the first desirable; and, according to Mr. Loudon, he recommended that the characteristics of each variety should be gathered from such causes, as the order of the catkins, the position and insertion of the catkins, at the period of the Roman invasion. For hampers or rods or coarse basket-work, are required; but the male plant should be selected when, for other purposes in which the willow is used, toughness and delicacy are requisite.

The common white willow (Salix alba), often called the Huntingdon willow, is more extensively planted as a timber-tree than any other, and next is the Russell or Bedford willow (Salix Russelliana), so called after the late Duke of Bedford, who brought it more generally into notice, and both grow rapidly, attaining a height of seventy and even eighty feet, though about sixty feet is their common height. Dr. Johnson's willow at Lichfield, which was blown down in 1829, was of the latter species. The weeping willow (Salix babylonica), the common osier or ‘Salix viminalis’, is another common species, socalled from the golden hue of its bark. The weeping willow (Salix capra, or goat willow), is the most important species being the Salix caprea, or goat willow, which bears the yellow blossoms called palms, and possesses many valuable qualities. Bees are particularly fond of this blossom, which is a grateful resource to them after their hybernation, when flowers have scarcely dared to make their appearance. The yellow willow (Salix vitellina) is another common species, so called from the golden hue of its bark. The wicker or willow hays are formed for the earliest ages. The Britons were skilful basket-makers at the period of the Roman invasion. For hampers and baskets, the rods are made use of both with and without the bark; in the latter case, after being washed in clean water, the baskets are placed in a close room and subjected to the vapour of sulphur, which renders the colour delicately white. The rods are split into lengths for wicker baskets and other light articles. Hats may be made from willow shavings. Hoops for barrels are made by slicing the rods in two equal parts; and the cooper finds even the bark of use. The small twigs need not be thrown away, as the gardener finds them useful in tying up plants. Cattle thrive upon the leaves. Willow is in demand for the manufacture of hay-rakes and other implements of manual labour. It is said to have the property of whetting knives; and though soft, it does not split. Charcoal made from willow readily ignites, and is, therefore, preferable to any other for gunpowder, and is esteemed by artists for crayons. The bark has tanning and dyeing properties; and an extract prepared from it, called salicine, is only inferior to quinine for its medicinal virtues. As the willow is so easily pro-

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pagated, it is employed with much advantage in strengthening the banks of canals and rivers, no digging being necessary, as in planting other aquatic trees with this object. Live fences of willow are of very speedy growth, and the willow stakes in a hedge often take root when they were not used with a view to their growth. The Thames and the Cam yield the largest supply of willows for all the various useful purposes which render the tree an object of consideration. In the slowly indisturbed lands of Cambridgeshire and Huntingdonshire there are large willow-plantations. Before the last war, willow for baskets was frequently imported from Holland.

The willow is the emblem of deserted love, and as such it is alluded to by many of our old poets. Spenser calls it—

"The willow, worn by forlorn paramour."

A TAME SQUIRREL.

[From a Correspondent.]

In the middle of May the children of a farmer took a tame squirrel from the nest, at an age when it had begun to eat a little, though it was still nursed by its mother. Its captors placed it under the care of a cat who had then only kittens, all the rest of her litter having been drowned. The cat nursed the little squirrel along with her own offspring for about a week, at the end of which time it (the squirrel) was purchased by a gentleman's family, and immediately transferred to another cat, in a similar predicament with the other, except that she had two surviving kittens instead of one. Both cats treated their foster-child with equal kindness, though the first was naturally a fierce, ill-tempered creature, and the second was equally remarkable for a sweetness and gentleness of disposition quite uncommon in her race.*

The young squirrel remained under the care of its new nurse for another week, and lived on terms of perfect friendship with her kittens as well as herself. Although she constantly nursed him, he readily ate biscuits, potatoes, and sugar moistened with water: this last was always his favourite food. He also drank, even at this time, great quantities of water, a practice which he always continued. He was as tame as possible when handled, and allowed himself to be fondled as much as was consistent with his restless nature. When removed from the cat, he was kept for a short time in a large cage which had been occupied by doves; but being very unhappy in confinement, he was soon set at liberty, without much hope of seeing the dress around them; or in the neckcloth or dress worn by his foster-nurse. It appeared not understanding their hostile intention; but when he was attacked by both, he was terrified, and made his escape. What is remarkable is, that all this time the old cat seemed still to recognize her foster child, and remained very quiet, without making the least attempt to hurt him. This was the last time the squirrel and cats saw each other.

Puss, though now fully at liberty, and able to feed himself out of doors, continued to frequent the house, and came several times a day to be given of play with the other members of the family. He was a most amusing little pet, full of fun and frolic, like all squirrels, and tame to a degree which could not be surpassed. He delighted in being present at meals, when he would jump upon the table, run round it, and either receive food from the hand, or select whatever suited his fancy, particularly bread and butter and potatoes. It was observed that he always chose the largest from amongst the articles of food before him; he would run round the table when spread for dinner, and make away with the largest piece of bread; at dinner he would snatch the largest potato out of the dish, and at breakfast run away with the largest pat of butter. When he had satisfied himself, he carried off whatever he could to a place of concealment, which he had always chosen: for instance, he would attempt to hide nuts and bits of bread and butter on the person of the young ladies of the family, attempting to scratch up the dress around them; or in the neckcloth or dressing-gown of the gentlemen. He frequently buried the nuts in the ground, or in the cavities in the trunks of trees, and would return to them, grub them up, and take them, after an interval of days or weeks. This propensity for hiding his food he manifested from the very first.

On one occasion it seemed as if the squirrel had imbibed something of the carnivorous nature of his foster parent. He discovered in the shrubbery a chaffinch's nest, from which he stole the young birds, one by one, and killed one of them, of which he partly devoured. He was soon made to take it away from him. On his third visit to the nest, he fell in with his old playmates the kittens, who had been attracted to the spot by the scent of blood; whereupon he immediately abandoned his murderous occupation, and in great delight began a game of play with them; for they too preferred amusing themselves with him, to pursuing their natural prey.

He always came when called by his name 'Puss,' and though he often bit in play (and pretty sharply too), he never took that means of expressing anger,

* This cat was hers by no means unworthy of notice. The constant and unweary attachment she showed to both her master and mistress, especially to the latter, though she had not received any particular notice from her, were extraordinary. Whenever the lady came into the kitchen, Fair (such was her name) invariably by the most engaging caresses endeavoured unremittingly to attract a little attention, and was quite transported if she succeeded. She would follow them round the garden and in their walks like a faithful dog, or at any particular notice from her, were extraordinary. Whenever she was always known to scratch or express anger, except against a dog on behalf of her kittens.
which he showed only by a growl. When impatient for food, he made a little grunting noise. He loved to climb up the persons of all the inmates of the house, which he did with the greatest agility. Though he did not seem to bestow affection on one more than another, or to distinguish individuals as such, yet he distinguished with all precision and knowledge the same number of persons, though in much more in one dress than another. The footman, for instance, when in his livery, he always delighted to clamber over; but when out of livery, he paid no attention to him. He never showed any fear of strangers, nor of any kind of animal.

Puss continued the pet and favourite of the whole house for three months. In August the family left that part of the country, and the squirrel was left behind, on account of the difficulty of removing him. He was familiar and amusing up to the last, even after he had been caught and confined two or three times with the view (afterwards abandoned) of taking him away. On the departure of his owners, a gentleman in the neighbourhood kindly took charge of the little animal and led him to his own residence. Here he remained very contentedly, taking up his abode in the garden, where he did not, however, display the same familiarity as formerly, and though every kindness was shown him, and he was tempted with his favourite kinds of food, he could not be induced to enter the house in the presence of its inmates, though he would make his way into the drawing room when they were not there; and out of the bread and butter they had put for him. Once, too, he ran up the arm of one of the ladies as she was walking in the garden, and accompanied her to the house to be fed. Having received a piece of potato, he retired. The wild squirrels have taken no notice of him, and at this moment he is still alive and happy in the state of liberty.

Slavery in Russia.—Some of Count Chérémétieff’s serfs are merchants, and very wealthy. The riches of a serf are generally obtained by procuring his master’s permission to leave his estate, and follow some trade in a town where he can, without interruption, turn a small capital and his natural shrewdness to account. This boon is well paid for if he is successful. In the country, in cases where the landowner’s caprice does not interfere with the provisions made by the law for the serfs’ benefit, they sometimes accumulate large sums; for they spend but little upon themselves, and an increase of wealth does not make an alteration in their habits which might be expected. The custom is to allow the serf three days of the week to cultivate the portion of land assigned to him by his master, for whom he works the other three; and in this case, also, he sometimes reaches a state of comparative affluence.

Many of Count Chérémétieff’s serfs could of course, if permitted, purchase their freedom; but this nobleman has no idea of allowing them to take advantage of their own industry: on the contrary, it is a subject of self-gratulation with many to possess one rich serf, and it is affirmed that Chérémétieff is so proud of his, that no sum would tempt him to give them their liberty—a worthy descendent, truly, of his ancestor in the days of Catherine! With this man there is no plea of necessity, but it gratifies his vanity, for it has an effect when he invites foreigners to his country-seat. On these occasions the Count is received by one of his rich serfs, in a mean hut, built in the usual style of a Russian log-house, and fitted up with the rudest furniture; the table is covered with a black cloth, and the toasts turned out in some sack, wooden bowl of borsch, are placed upon it. The party merely taste this humble refreshment, when the door leading to another house at the back is opened, and the noble proprietor and his friends are then ushered into an apartment handsomely furnished: the table here is loaded with plate, glass, fruit, and a profusion of viands, in the arrangement of which little taste is displayed; and champagne, quass, and vodkas are served, one as freely as the other. The guests leave the house astonished by such an entertainment given by a Russian serf, fancying perhaps, that, under the circumstances, the man is as well

pleased to be a slave as free; and, in some cases, they are likely to be right. In all probability the serf who has thus feasted his master and his friends can scarcely read, knows nothing of figures, counts with beads, and has a beard of enormous length: he makes, however, large sums of money, for he is shrewd, cunning, and saving. His manner of dressing is the same as in any other case, he receives his lord, or at one of his own children’s weddings.—Jesse’s Notes of a Half-pay in Search of Health.

Travelling on the American Prairies.—Having taken leave of our friends in the boat (on the Upper Missouri), we mounted the green bluffs, and steered our course from day to day over a level prairie, without a tree or a bush in sight to relieve the painful monotony, filling our canteens at the occasional little streams or pools of water that they used to abound in, and at this rate, we gained about 70 miles a day. On one of our nights we were overtaken by a heavy snowstorm, which checked our progress. We again moved forward on the following morning, making about 40 miles before we again became involved in the same distressing circumstances. We finally arrived at a small steamboat settlement, on the 13th of last, after an absence of eight days from our friends in the boat. We remained at this place a few days, and then started on our return journey. Every day of our way was over a continuous prairie, with a verdant green turf of wild grass of six or eight inches in height, and most of the way enamelled with wild flowers and filled with a profusion of strawberries. From this very first day the scenery was monotonous, and became exceedingly painful from the fact that we were, to use a phrase of the country, ‘out of sight of land,’ i.e. out of sight of anything rising above the horizon, which was a perfect straight line around us, like that of the blue and boundless ocean. The pedestrian over such a discouraging sea of green, without a landmark before or behind him, without a beacon to lead on or define his progress, feels weak and overcome when night falls; and he stretches his exhausted limbs apparently on the same spot where he has slept the night before, with the same prospect before and behind him; the same grass and the same wild flowers beneath and about him; the same canopy over his head, and the same cheerless sea of green to start upon in the morning. It is difficult to describe the simple beauty and serenity of these scenes of solitude, or the feelings of feeble man, whose limbs are toiling to carry him through them—without a hill or tree to mark his progress, and convince him that he is not, like a squirrel in his cage, standing still all the while. One commences on peregrinations like these with a light heart and nimble foot, and spirits as light as the very air, but his spirit soon tires. I got up for a couple of days in tolerable condition, but my half-breed companions took the lead at length, and left me with several other novices far behind, and the pain in my feet became so intolerable, that I felt as if I were going to faint. I then turned my toes in, and that civilized man can walk with the coarsest linen, and a black loaf, with some salt, and his toes turned out if he chooses, if he will use a stiff sole. One cannot walk on such a prairie without having one’s feet in the ground. The ground is hard and rocky in summer, and soft and muddy in winter, and it is a constant struggle to make the progress that we make. We generally get on very well. I soon found, upon trial, that by turning my toes in my feet went more easily through the grass; and, by turning the weight of my body more equally on the toes, enabling each one to support its proportionate part of the load, instead of throwing it all on to the joints of the big toes, which is done when the toes are turned out. I rigidly adhered to this mode, and found no difficulty on the third and fourth days of taking the lead of the whole party, which I constantly led from the 13th of last until our journey was completed. On this march we were all travelling in moccasins, which being made without any sales, according to the Indian custom, had but little support for the foot underneath, and consequently soon deserted us to excruciating pain whilst walking according to the civilized mode with the toes turned out. From this very painful experience I learned, to my complete satisfaction, that man in a state of nature, who walks on his naked feet, must walk with his toes turned in, and that civilized man can walk with his toes turned out if he chooses, if he will use a stiff sole under his foot, and will be content at last to put up with an acquired deformity of the big toe.—Cather’s North American Indians.
El Territorio de Chile se forma un estrecho desliz entre la parte occidental de los Andes y el Océano Pacífico, extendiéndose desde el desierto de Atacama, en 25° S. lat., hasta 37° S. La Provincia de Valdivia también forma parte de la república, extendiéndose más al sur; los Chilenos se declaran, de hecho, la costa entera hasta el Estrecho de Magallanes. La Archipiélago de Chiloé, situada entre 41° 48' y 43° 50' S. lat., y 73° 20' y 74° 30' W. long. Este archipiélago es una provincia integral de la Chiloea e indios de Araucanía. El campo en general es fétil, pero los cultivos de cultivos intertropicales no prosperan, y la agricultura está limitada a los productos de Europa. El maíz es cultivado, pero no en grandes cantidades. El trigo es el producto principal; se cultiva en toda la región, y la harina es exportada a las costas occidentales de Sudamérica, donde se convierte en un importante producto de exportación.
only on a few estates, and rye is not known. Leguminous vegetables are grown abundantly, especially different kinds of beans, and supply an article of export. Hemp is raised in the country north of the Rio Maypo, and grows to an extraordinary height.

Vegetables are not much cultivated, except in the countries about the capital and the most frequented parts. Potatoes however are grown in great abundance in the northern districts. Capsicum is raised in the valley of Aconcagua, and forms a considerable article in the commerce of the country. The quinua (Chenopodium quinoa) is peculiar to Chile, and, in the southern provinces, is raised in abundance, and somewhat resembles millet: a pleasant beverage is made of it. Melons and water-melons, as well as pumpkins, succeed very well in the northern provinces, where they are raised in great quantities, and attain a surprising size.

Figs, grapes, pomegranates, oranges, and peaches succeed best in the most northern districts, whence they are exported to the other parts of the state. Wine is made at different places, but not yet with any great success. The best is made near Concepcion. The olive-tree succeeds as well as in Spain, and its cultivation is rapidly increasing; but the oil is bad without a proper method of preparing it. Extensive forests exist in the vicinity of the river; and in the foot of the Andes in the southern provinces. The fruits are hardly eatable, but cider is made of them. The forests, which cover so considerable a portion of the southern provinces, contain many fine timber-trees, which form one of the more important articles of export.

Cattle are very abundant north of the Rio Maule, the declivities of the mountains and high hills affording copious pasture for four or five months, and some low tracts, which are sown with lucerne, for the remainder of the year. Single proprietors sometimes possess from ten thousand to twenty thousand head of cattle. Live stock, jerked beef, tallow, and hides are large articles of export. Cheese is made on the banks of the Rio Maule and sent to Peru; and butter in the neighbourhood of the larger towns. Horses have greatly decreased in number during the last twenty years. Sheep are not numerous, and their wool is bad. Goats are kept by the lower classes, but are not numerous. Swine are found in abundance in the archipelago of Chiloé, whence hams are exported; on the continent they are less numerous. Pork is salted in the harbours as provisions for the vessels.

Gold-dust is found in the sand of nearly all the rivers which come down from the Andes, as in the Rio de Aconcagua, Rio Maule, and Biobio. Some gold-mines occur in the northern districts, where they are worked, but the produce is inconsiderable. Silver is more abundant, but the average is only from nine to ten marcs (one marc = eight ounces) in the cargo, or five thousand pounds of ore. In 1832, however, very rich silver-mines were discovered about sixty miles south of the town of Copiapó, where the ore was found so rich as to contain sixty or seventy per cent. of pure metal. Their working has commenced with great activity, and all the other mines are nearly abandoned. The copper-mines are very numerous; they occurred in the western part of the central district, Illapel, Coquimbo, Copiapó, and Suasco: copper is also found farther south in the Andes, but is not worked. A small portion comes to Europe, but by far the larger part goes to India and the United States. Ores of lead, tin, and iron are said to exist, but they are not worked.

The coal formation extends under a considerable part of the southern provinces, and is now worked to a considerable extent. Salt is also produced, but not in sufficient quantity, and is, therefore, imported from Patagonia and Peru.

The commerce of the country, which is chiefly carried on at Valparaiso, is considerable and increasing. The exports are calculated at about a million and a half, and the imports at a million, one-third of the trade being in the hands of the English. In the single port of Valparaiso, in 1834, the amount of tonnage entered inwards was 27,000; of this 20,150 were English, and 20,700 from the United States. The population is variously estimated, but the most recent statement, founded on a roughly-taken census, gives it as 1,400,000: these are almost entirely of European descent, little mixture having taken place with the original red inhabitants, there being very few negroes and no native Indians north of the Biobio, except in a few of the valleys of the Andes south of Santiago.

The great and perhaps the only drawback to the beauty and serenity of the climate arises from the frequency of earthquakes. The whole district seems to repose on a crust over an abyss of subterraneous fire. There are said to be no less than fourteen active volcanoes in the Andes which forms the boundary of the republic. In the northern districts slight shocks are felt almost every day, and occasionally several times in a day. Sometimes they destroy the towns and lay them in ashes, and great effects are sometimes produced. In 1819 the town of Copiapó was levelled to the ground; and in 1822 the damage done in Valparaiso and the country about it was not much less. In 1835, Valparaiso, Concepcion, and the neighbourhood again suffered greatly, the shock extending from Santiago to Valdivia. Concepcion was utterly destroyed, and fifty lives were lost; but its effect was greater on the ships lying at the port of Talcahuano, which is thus described by A. Caldecough, who was in the country at the time:—"It was remarked that the sea had retired so much beyond its usual limits, that all the rocks and shoals in the bay were visible. It flowed again, and again retired, leaving the ships dry which were at anchor in the harbour. Then an enormous wave was seen slowly approaching the devoted town from the direction of the Boca Chica. For ten minutes it rolled majestically on, giving time to the inhabitants to run to the heights, whence they saw the whole place swallowed up by this immense breaker. In this moment of terror men saw the roller with little accordance as to its size; some compared it to the height of the loftiest ship, others to the height of the island of Quiriquina. It carried all before it, and rose to an accurate measurement about the high-water mark. A small schooner of eighty tons, nearly ready for launching, was lifted over the remains of the walls, and found lying among the ruins three hundred yards from her stocks. The reflex of this roller carried everything to the ocean. Another and a larger wave succeeded; but taking a more easterly direction, the ruins of Talahuano escaped, but the Isla del Rey was ravaged by it. A fourth and last roller, of small dimensions, advanced, but nothing was left for further devastation. While these great waves were rushing on, two eruptions of dense smoke were observed to issue from the sea. One, in shape like a lofty tower, occurred in the offing; the other took place in the small bay of San Vicente, and after it had disappeared a wonderful decree occurred: the sea looked like an inverted cone, as if the sea were pouring into a cavity of the earth. In every direction in this bay, as well as in Talahuano, vast bubbles broke, as if an immense evolution of gas were taking place, turning the colour of the water black, and exhaling a fetid sulphureous odour. At San Tomé, on the other side of the bay, the roller did immense damage; and on the island of Quiriquina the cattle dashed off the cliffs from panic. In this island the waves injured houses
forty feet above the present level of high-water, and during the three following days, the sea ebbed and flowed irregularly.

For the following lively description of the town of Santiago, which we have given a representation at the head of this article, we are indebted to Sutcliffe's 'Sixteen Years' Residence in Chile, from 1822 to 1839.'

The city of Santiago would, if it was properly regulated by its municipal body, be one of the cleanest and most salubrious cities in South America. It is laid out in squares of one hundred and thirty-eight yards in width; all are paved, and the principal ones flagged on each side; those that run from the east to west have canals, which are constructed to irrigate the town, and carry off the filth.

Since my arrival in Chile, a great many improvements have been made in the capital, and a spirit of innovation has commenced in the mode of building; for in lieu of the low-built houses built of 'adobes' (bricks dried in the sun), that took up the sixth or eighth of a square, there are now substantial houses built of brick and stone, that only occupy one-half of the ground, and are of two or three stories high. Don Ambrosio Aldunate has built an edifice, occupying one side of the principal square, that is four stories high; the lower range is occupied by the stores of the more respectable tradesmen; but the upper stories are all empty, and will, perhaps, have to remain untenanted on account of the dread of earthquakes: there are also a series of neat wooden shops under the portico, which give it the appearance of a bazaar. The state-house or palace is a long irregular building, divided into three departments, one of which is the residence of the president of the republic; [the others are] the treasury and public offices, the municipal hall and prison; on another side is the cathedral, and the residence of the bishop; the other is of private dwellings and shops. In the centre of the square is a fountain, in which is a beautiful marble monument, made in Italy, allegorical of the independence of Chile, from which pure water gushes to supply the city.

There are two promenades: that of winter is on one side of the square, which is a series of strong parapets, that are built of brick and stone, about eighteen feet from their foundation, six in thickness, and well supported by buttresses: this was projected and partly built by Don Ambrosio O'Higgins, Conde de Ballenar, when he was president of Chile, and now extends along the margin of the Mapocho, about four thousand two hundred and sixty yards from the bridge, in order to protect the city from the river, which, although in the dry season it appears to be nothing but a petty stream, has often during the rains been so swollen and rapid as to threaten Santiago and La Chimba with destruction. I have often heard strangers express their surprise at seeing the superb bridge, and wonder at the Chileans having commenced such an expensive undertaking as the building of it and the Tajamar must have been; and the Chileans themselves have often said, 'Either sell the bridge or buy a river,' in order to ridicule Los S. S. O'Higgins and Zanartu, who projected these useful and now properly appreciated undertakings; for had it not been for the parapets during the year 1827, Santiago would have been washed away.

The walk on the Tajamar is incommodious, although a favourite one: close to the city there is a short alameda, with a few seats, and a fountain, with several willow and poplar trees; and near to the east end is a race-ground, where on a feast-day numbers of Chinganas are congregated. The races in Chile are of a short distance, and from one to two or three quadras; the horses are not saddled; they are rode only with a sheep-skin or cloth, and boys who are well trained: the horses start at full speed. The Chileans are very fond of such sport, and they are often races of consideration: these are run on the Lomas, or plain, about one and a half or two leagues from the capital, on the Valparaiso road: on these occasions it is well worth the while of a stranger to attend, for both high and low almost vacate the capital; and there is a great display of equipages, from that of his excellency the president, the chief of the town, or the president of the republic, to the bullock-cart, or, as our countrymen say, 'Noah's ark.'

The chinganas (dancing-rooms) are held in houses, ramadas (sheds made of the boughs of trees), or in carts that are latticed over, and covered with gaudy trappings and flags: each has two or more musicians and singers; these are well dressed and decorated, and no small quantity of paint is bestowed on some of their faces; their instruments are the harp, guitar, and ravel (fiddle with three strings); and as the carts and ramadas are generally close to each other, their music, if so it may be called, is to a stranger the most discordant noise that can be heard: for let the reader figure to himself about twenty or more persons, in an area of about thirty yards, singing or bawling as loud as their lungs will allow them, to the tunes on the above-named instruments, as well as others who are drumming with their hands on the bottom of the harp, whilst the 'samba queka,' or other favourite step is danced: these are the amusements of the lower classes; but still many even of the most respectable enjoy a 'baile de golpe,' and the chingana of 'Las Señoras Petorquinas,' who were the stars of their profession, was well patronised, for they drew an immense concourse on their commencement, and reaped no small emolument from their agility.

The Alameda de la Canada is one of the handsomest in Chile, or of any I have seen in South America. It is about 970 yards in length: this promenade is divided into three walks, and on each side is a road for carriages; there are three canals or aequias, two of which are handsomely constructed, and lined with willows; there are six hours of both; there are six willows, that protect such as frequent the walk during the day from the sun; the middle walk is furnished with stone seats, and at the bottom is a fountain, placed in an octagon. During the summer evenings, and especially on a feast-day, it is a pleasure to visit this promenade, for it is then crowded with the beauty and fashion of the capital, who leave their equipages in the outer street, and take a few turns to enjoy the cool breeze, and animate and enliven the scene.

Santiago is governed by a municipal body, and divided into eight departments: each has an inspector and subalterns. There are several hospitals, a house of correction, and a dépot for the convicts, who are employed as scavengers. The porters and water-carriers have a tax imposed upon them, which is, to the amount of twice a month, with clubs and lassos; they are divided into several gangs, have a district assigned to them, and then commence at an early hour to catch and kill every dog they meet with, in order to free the city from them, except such as have collars, or are with their owners: a cart brings up the rear, into which the carcasses are thrown, and no small emolument is derived from their skins. The town has a regular municipal police, both horse and foot, and is patrolled both by day and night, the expenses being supported by a local tax.

There are several market-places; the principal, La Recoba, is a building that occupies about four acres, having shops on each side, and encloses a space that is divided into departments for the sale of meat,
flour, fruit, vegetables, &c.: it is kept tolerably clean, and well worth the while of a stranger to visit it on a morning; but he must not expect to meet any ladies or respectable persons making purchases, for all the marketing in Chile is performed by the servants, who are tenacious of this privilege, and at times insult such foreigners as dare to introduce the custom of their own country by being their own purveyors, for it is a matter of notoriety that almost every servant has his own interest at heart, and no few dœuces are given to the customers.

Shopping is almost always performed by the respective classes of the evening, and it is surprising to see their judgment of colours. A few foreigners, with their retail shops, and these are principally Frenchmen. Few foreign merchants reside in Santiago, for ever since the Custom-house has been built at Valparaiso, the principals reside there, but there are a number of tradesmen and mechanics; the last, if steady, get constant work, and I have known several, such as tailors, who not only earn a sufficient, but a tolerable subsistence, and make their profit, as the coat-makers, &c., realise a handsome competency in a few years.

"The neighbourhood of Santiago, and the valley of Mepoohoa, is laid out in villas and small farms, which are in the highest state of cultivation, and in which nearly all European fruits are grown; but their principal products are the vine, and a species of lucerne: the latter supplies the capital with excellent forage." The winters at Santiago are mild, but in the rainy season Englishmen feel the want of a fire-side instead of the Spanish chafing-dishes, and latterly, after much effort, some permissions have been granted for the erection of chimneys. The population of the city is about fifty thousand.

The other principal towns of Chile are Concepcion, Valparaiso, Rancagua, San Fernando, Talca, San Felipe, Valdivia, and Chiloé.

**Currants**—which form by far the most important and indeed the staple article of the Grecian commerce—are the produce of a species of vine so nearly resembling the grape-vine in form, leaf, size, and mode of growth, as to show no apparent difference to the general observer. The answer to this is the fact, that however the "hands" of the ape may be important to him as instruments of progression in his native forests, not one of them, or all of them together, are, or can by any means become, in any degree comparable to the hand of man as an instrument of general action. The most important member of the hand, the thumb, however well suited in its general structure to this end, is so formed as to require that it should be capable of performing a limited number of objects as the constitution and habits of the ape require, and although, so far, a perfect hand, is by no means capable of those infinitely tender applications which, in his natural postures and movements, render man the undoubted lord of this lower universe. Although ashamed to dwell on this matter, we cannot abstain from also pointing out that the perfect use which man has of his two hands, without being obliged in any way to employ them to assist his stationary position or his movements from place to place—would alone create a wide and important distinction, seeing that the ape is obliged to employ his fore extremities equally with his hind ones as instruments of progression in his native trees; and while the latter are, of course, inadequate to do so on all-fours, or, in attempting to walk erect, to employ his long fore members to stay his tottering steps, just as a lame man employs his crutches.—**Christian Traveller.**

**Hands of the Ape.**—The apes have no proper feet; for what are called such are as distinctly hands as are the terminal organs of the arms: that is, the great toe in the foot of man, by which chiefly he is enabled to walk in an erect position, being a perfect thumb in the ape. Whence the animal is naturally formed for climbing, and for living in trees; and its natural position in walking on the ground, and the position which it always assumes when not under human discipline or example, is that of all-fours, the body being supported on four hands, instead of on four feet, as in quadrupeds. Hence Cuvier and other recent zoologists have invented a new name by which animals of this class may be properly distinguished from all others. This is quadrumanus, or four-handed, by which they are equally distinguished, on the one hand, from quadrupeds, or four-footed animals, and, on the other, from man, who, in all his tribes, is uniformly and alone hominæ, or two-handed. In man, the hand is an organ so exquisitely finished, so perfect an instrument of his will, so admirably adapted for working, and so most ingenious devices, that some physiologists would regard this as alone sufficient to account for his superiority to all living creatures. Therefore, in giving to the ape four hands, whereas man has but two, we seem to lay ourselves open to such objections as those of Colonel Bory de St. Vincent, who, in his zeal to take down that arrogance which indisputably the recognised races of men to admit the brotherhood of the monkey and the ape, asks, "Are not four hands, in fact, of more value than two, as elements of perfectibility?" The answer to this is the fact, that however the "hands" of the ape may be important to him as instruments of progression in his native forests, not one of them, or all of them together, are, or can by any means become, in any degree comparable to the hand of man as an instrument of general action. The most important member of the hand, the thumb, however well suited in its general structure to this end, is so formed as to require that it should be capable of performing a limited number of objects as the constitution and habits of the ape require, and although, so far, a perfect hand, is by no means capable of those infinitely tender applications which, in his natural postures and movements, render man the undoubted lord of this lower universe. Although ashamed to dwell on this matter, we cannot abstain from also pointing out that the perfect use which man has of his two hands—without being obliged in any way to employ them to assist his stationary position or his movements from place to place—would alone create a wide and important distinction, seeing that the ape is obliged to employ his fore extremities equally with his hind ones as instruments of progression in his native trees; and while the latter are, of course, inadequate to do so on all-fours, or, in attempting to walk erect, to employ his long fore members to stay his tottering steps, just as a lame man employs his crutches.—**Christian Traveller.**

**Foot of Man and of Orang-Utan.**

**MAY 14, 1832.**

**THE PENNY MAGAZINE.**
THE OLD AND YOUNG COURTIER. — No. V.

THE OLD HALL.—CHRISTMAS.

"After I had travelled through the east parts of the unknown world, to understand of deeds of arms, and so arriving in the fair river of Thames, I landed within half a league from the city of London, which was (as I conjecture) in December last; and drawing near the city, suddenly heard the shot of double cannon, in so great a number, and so terrible, that it darkened the whole air: wherewith, although I was in my native country, yet stood I amazed, not knowing what it meant. Thus, as I abode in despair, either to return or continue my former purpose, I chanced to see coming towards me an honest citizen, clothed in a long garment, keeping the highway, seeming to walk for his recreation, which prognosticated rather peace than peril: of whom I demanded the cause of this great shot: who friendly answered, 'It is,' quoth he, 'a warning to the constable-marshall of the Inner Temple to prepare to dinner.'"

It was thus that the members of the Temple in 1561-2 announced "that Christmas was come!": the constable-marshall of that year was the celebrated "old courtier of the queen," Robert Dudley, Earl of Leicester, whom the same writer thus describes:


No. 650.

"Thus talking we entered the Prince's Hall, where anon we heard the noise of drum and fife. 'What meaneth this drum?' said I. Quoth he, 'This is to warn gentlemen of the household to repair to the dresser; wherefore come on with me, and ye shall stand where ye may best see the ball served;' and so from thence brought me into a long gallery, that stretched itself along the ball near the prince's table, where I saw the prince set: a man of tall personage, of manly countenance, somewhat brown of visage, strongly featured, and thereto comely proportioned in all lineaments of body."

At this festival were present foreign ambassadors, the queen's ministers, and many of the principal nobility. It was maintained every day until Twelfth-day, and each day had its distinct regulations. The general nature of the feasts may be gathered from our previous papers. On Christmas-day morning, "Service in the church ended, the gentlemen presently repair into the hall to breakfast, with brawn, mustard, and malmsey;" and this savoury meal is repeated each day, except Wednesday, of which the regulation is "in the morning no breakfast at all;" but "at night, before supper, are revels and dancing, and so also after supper." The whole festivity was intermixed with many mock solemnities, carried on by mock dignitaries, and chiefly of a legal character; even the attendants are of a high order, as mixing in the mirth;
the young gentlemen of the house attend and serve till the latter dinner, and then dine themselves." On St. Stephen's day the "master of the game," in green velvet, is officially presented to the prince between the first and second courses, and then a "huntsman cometh into the hall with a fox and a purse-net, with a cat, both bound at the end of a staff; and with them nine or ten couple of hounds with the blowing of hunting horns; and the fox and cat are the hounds set upon, and is dead beneath the fire;" the "master of the game" being on this occasion Christopher Hatton, afterwards Elizabeth's "grave lord keeper," who here "led the brawls," while probably in his fancy's eye

\"The seals and maces danced before him.\"

On St. John's-day "about seven of the clock in the morning the Lord of Misrule is abroad," but it is gravely stated that "his power is most potent" at night. To guard, however, against any irregular exercise of the privileges of this potentate, one of the rules of the Temple provided—\"That no gentleman of this society, nor any other, by appointment, choice, or assent of any gentleman of this house, should in time of other things, take upon him, or use the name, place, or commandment of the lord, or any such other like; or break open any chamber; or disorderly molest or abuse any Fellows or officer of this house, within the precincts of the same, upon pain of the abuse or disorder.\"

Similar proceedings took place annually at the other principal Inns of Court, and most of the great noblemen's houses in the country. The houses and halls were profusely ornamented with holly, ivy, and other evergreen foliage, and on every such occasion the fragments of the feast were distributed to the poor. At Gray's Inn it was a regulation "that the third butcher should be at the carrying forth from the buttery, and also at the distribution of the alms, thrice by the week at Gray's Inn gate, to see that due consideration be had to the poorer sort of aged and impotent persons;" the deserving then, as now, in few cases receiving the advantage designed for them, while bold impostors were in effect produced and encouraged. Charity, however, was intended, and upon some claim being made for the distributee, the butler must answer the question "Are you a gentleman? or a person of the middle sort? or any person of质量 or commandment of the lord, or any such other like; or break open any chamber; or disorderly molest or abuse any Fellows or officer of this house, within the precincts of the same, upon pain of the abuse or disorder.\"

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\"Quarrel with mince-pie, and disparage Their best and dearest friend, plum-porridge;\"

and though the poetry of Ben Jonson and the scenery of Inigo Jones maintained the popularity of masques for a time within a certain sphere, yet the poet was aware of the existence of the growing prejudices against them. In his masque of 'Love Restored,' Masquerado and Robin Goodfellow lament that there is to be no masque, which Plutus, disguised as Love, has forbidden. Plutus addressing them says, \"You shall find custom hath not so grafted you here, but you may be rent up, and thrown out as unprofitable evils. I tell thee, I will have no more masking; I will not buy a false and fleeting delight so dear; the merry madness of an hour shall not cost me the repentance of an age.\" Robin asks, \"Are these your court sports? Would I had kept me to my gambols o' the country still, selling of fish, short service, shoeing the wild mast or restating of robinhood, so that and thus describes his own character:—\"I am the honest, plain, country-spirit, and harmless, Robin Goodfellow; he that sweeps the house and the hearth clean, riddles (sifts) for the country-maids, and does all their other drudgery while they are at hot-cockles; one that has discoursed with your court-spirits ere In his 'Masque of Christmas' Ben Jonson again alludes to the Puritanical feeling against masques and mummeries as relics of Catholicism. \"Why, gentlemen, do you know what you do? ha! would you have kept me out? Christmas, old Christmas, Christmas of London, and Captain Christmas! Pray you, let me be brought before my lord chamberlain, I'll not be answered else. \"Tis merry in hall, when beards wag all: I have seen the time when you would have wished for a merry Christmas; and now you have me, they would not let me in: I must come another time! A good jest, as if I could come more than once a year. Why, I am no dangerous person, and so I told my friends of the guard. I am old Gregory + Christmas still, and, though I come out of Pope's-head Alley, as good a Protestant as any in my parish. The truth is, I have brought a masque here out of the city, of my own making, and do present it by a set of my own sons, that come out of the lanes of London, good dancing boys all.\" The London 'prentices were active spirits at that time, but the period was rapidly approaching when their activity was displayed in other and far less pleasant circumstances. We give one or two full cuts between Ben Jonson's 'Pleasure recoupled to Virtue,' as pertaining in its character to the jolly cheer of Christmas of both periods.

\"Room! room! make room for the Bonning Belly, First father of sauce, and devil of jelly; Prime master of arts and the giver of wit, That found out the excellent engine the spit; The plough and the flail, the mill and the hopper, The batch and the boulter, the furnace and copper, The oven, the bavin, the mawkin, the pel, The hearth and the range, the dog and the wheel; He, he first invented the hogscald and turn, The ginnett and vice too, and taught them to run, All country games.\"

* An allusion to the alteration of the Calendar by Pope Gregory, a short time previous.
And since with the funnel and hippocra bag,
He has made of himself, that now he cries away!
Which shows, though the pleasure be but of four inches,
Yet he is a woe for the gullet who pinches
Of any delight, and use escapes his lack,
Whatever to make of the belly a sack!
Hail! hail! plump punch! O, the founder of taste!
For fresh meats, or powder’d, or pickle, or paste,
Devour’d in half-a-dozen, roasted, or baked,
And emptier of cups, be they even or odd:
All which have now made thee so wide in the waist,
As scarce with no pudding thou art to be laced;
But eating and drinking until thou dost noot,
Thou bringest many graces to lack forth a god."

The general belief, however, of the deterioration of the character of courtiers had at least poetical evidence to repose upon. Spenser, in his 'Mother Hubbard's Tale', had given the following character of a true courtier, and certainly there were none in the court of James who could at all sustain any comparison there with, and probably not many during the time which has since eld.

"Yet the brave courtier, in whose beauteous thought
Regard of honour harbours more than aught,
Doth loath such base condition, to backbite
Any's good name for envy or despise;
He stands on terms of honourable mind,
Ne will he be carried with the common wind;
Of courts' inconstant mutability;
Ne after every tattling fable fly;
But hears, and sees the follies of the rest,
And thereof gathers for himself the best:
He will not creep, nor crouch with feigned face,
But walk sup right with come stedfast pace,
And unto all doth yield due curtesy,
But not with kissed kiss below the knee,
As that same apish crew is wont to do:
For he disdains himself to embrace thereto:
He hates foul leasings, and vile flattery,
Two filthy blots in noble gentry;
And lotheful leisure he doth detest,
The canker worm of every gentle breast,
The which to banish with fair exercise
Of knightly feats he daily doth devise:
Now menacing the mouths of stubborn steeds,
Now practising the proof of warlike deeds,
Now his bright arms assaying, now his spear,
Now the nigh-aimed ring away to bear:
At other times he casts to sew, the chase
Of swift wild beasts, or run on foot a race,
Of states, and eke of private men somewhat
Supplanted by fine falsehood and fair guile;
Of all the which he gathered what is fit
To enrich the storehouse of his powerful wit,
Which, through wise speeches and grave conference,
He daily ekes, and brings to excellence."

It must, indeed, be acknowledged, that though the customs of celebrating the Christmas and other festivals had not greatly changed, the personal character of the court had, even to the extent intimated in our ballad, and that James's favourites bore a far more marked resemblance to the apish hero of Spenser's tale:

"A thousand ways he them could entertain,
With all the thriftless games that may be found;
With mumming and with masking all around,
With dice, with cards, with billiards, far unfit;
With shuttlecocks, musketeering manly wit;
With courteous, and costly riotize,
Whereof still somewhat to his share did rise."

**ABORIGINES OF VAN DIEMEN'S LAND.**

Van Diemen's Land, so called in honour of Van Diemen, governor-general of the Dutch possessions in the East Indies, was discovered in 1642 by Tasman, a Dutch navigator: in geographical works, the island is often called Tasmania. For above a century afterwards no Europeans touched its shores. In 1772 it was visited by Captain Marion, a Frenchman, who subsequently visited New Zealand, and left there a name which is recollected by the natives at this time for the signal vengeance which he took in consequence of a treacherous attack by the islanders. In 1773 Captain Furneaux anchored at Van Diemen's Land in the Adventure, one of the two ships sent under the command of Cook, on discovery voyage of the southern hemisphere. Captain Cook visited the island in 1777, on his last voyage. At this time it was supposed to be a part of New Holland, but in 1797 Lieutenant Flinders discovered the channel by which it is separated, and gave it the name of Bass's Straits, in honour of the surgeon of his vessel. In 1803 the governor of New South Wales dispatched a small party of soldiers and convicts to take possession of the island, in consequence of a rumour that the French were about to form a settlement upon it; and it soon became a penal colony for offences committed in England. Within the last twenty-five years a large number of free emigrants have settled in Van Diemen's Land, which now contains a population of about forty-five thousand persons. The climate resembles England much more than any part of its vast neighbour New Holland, and the fruits and productions of England arrive at great perfection.

Knowing what has taken place in other countries colonized by Europeans, the philanthropist may ask, with some apprehension, what has been the fate of the aboriginal inhabitants of Van Diemen's Land? When Captain Furneaux visited them, their general inferiority to the natives of New Holland was at once obvious, and they were classed with the miserable inhabitants..."
of Tierra del Fuego in point of intelligence. They were evidently a branch of the Papuan race, such as is found at the present day in New Guinea, on the north coast of New Holland, a race bearing a strong resemblance to the negroes of Guinea in Africa. From New Guinea the Papuan race may be traced northward through various islands of the Indian Archipelago, to the Malay Peninsula on the Asiatic continent. In this direction, with the exception of New Guinea, they are an isolated race, but have been driven from the coasts into the interior by a more civilized people. South-eastward of New Guinea, the same race is found in the large islands of New Britain, New Ireland, and the islands lying east of New Holland, to the archipelago of the New Hebrides. The aborigines of New Holland consist of the woolly-haired or Papuan race, and another race, having straight hair; but the latter are the most numerous and powerful. In Van Diemen’s Land the former race was alone found.

Forty years have scarcely elapsed since the settlement of Van Diemen’s Land, and for several years there has not been a single native on the island. In a country the size of Ireland, with a very scanty European population, there was, not, so far, room for the aboriginal indians, and they have been ruthlessly swept away! In 1804, before the settlement was a year old, an unfortunate collision took place, which brought on a state of hostility that ended only with the extermination of the wretched natives. They had assembled to the number of three or four hundred for the purpose of holding a ‘corrobory,’ or general meeting, and before separating, chopped down the huts erected by the settlers, and proceeded to some further violence, when the officer in command assembled the military and convicts, and drove the natives into the woods, killing, according to different reports, from twenty to fifty. Soon after this first outbreak, the natives made another hostile demonstration, when they were dispersed by a murderous fire of grape-shot. From this period feelings of retaliation and revenge prevailed on both sides, and the settlers were frequently murdered at the solitary places on the outskirts of the settlement. To revenge their death, the natives were hunted down and shot wherever they could be found. On one occasion a party of seventeen were murdered in cold blood while bathing. Their numbers were also thinned by the bush-rangers—convicts who had many purposes in view in the escape, and practised all the worst vices of civilized and savage life. One of these miscreants, who was apprehended, confessed that he had at times shot the natives for the purpose of feeding his dogs. Another took ten or fifteen native women to different islands in Bass’s Straits, to procure seal skins, and if on his return they had not accomplished the task assigned them, he was in the habit of tying them up to trees for twenty-four hours or a longer period, and if they proved stubborn, killed them outright. The natives of course made no distinction between these outcasts of society and the peaceable settler, and, when opportunity offered, wreaked their vengeance on all alike.

In 1829 and the two following years the colony was kept constantly on the alert, from these outrages, and the government were induced to adopt measures for capturing the native tribes. A large force took the field with the intention of driving the natives into the peninsula called Tasman’s Head, but they broke through the lines, and the expedition consequently failed. Subsequently, through the philanthropic exertions of a Mr. Robinson, the aborigines were collected from all parts of the island and removed to Flinders’ Island in Bass’s Straits, where means were adopted for civilizing them, and they were fed and clothed at the expense of the colonial government. Their numbers, however, were soon thinned by disease, and the governor of Van Diemen’s Land and the Secretary of State for the Colonies recommended that an asylum should be given to them at Port Philip, on the opposite coast of New Holland; but the Legislative Council of New South Wales refused their permission, on the ground that the natives were not sufficiently civilized. The total number of natives on Flinders’ Island in 1833 was only one hundred and twenty, of whom only four were children. If pains had been taken to reclaim them on the first settlement of the colony, in 1803, they might gradually have become useful members of the community as shepherds and herdsmen, occupations which the natives of New South Wales have in some cases been found capable of performing. As it is, the guilt of having exterminated them by acts of unmitigated barbarity and reckless cruelty cannot now be expiated in their case. Fortunately a more considerate and benignant feeling has sprung up within the last few years, and a wiser and more merciful course towards the aborigines in all our possessions has become a principle of British policy, of which it is to be hoped we shall never again lose sight.

Persian Swords.—Some very fine blades were sent to us for our inspection by a decayed widow lady, whose husband had been one of the former Doorance lords. One of these scimitars was valued at five thousand rupees, and the other at fifteen hundred each. The first of these was an Indian sword, made by one Zaman, the pupil of Asad, and a slave of Abbas the Great. It was formed of what is called “Albaree steel,” and had belonged to Ghoolam Shah Calora of Sindle, whose name was embossed upon it, and was brought home during the wars of Nadir Shah. The special cause of its great value was that the water could be traced upon it, like a skein of silk, down the entire length of the blade. Had this water been interrupted by a curve or cross, the sword would have been comparatively valueless. The second was a Persian sword, of the water called “Begumee.” The lines did not run down straight, but waved like a watered silk fabric. It had the name of Nadir Shah on it. The third was what is termed a “Kara” (black) Khorasan blade, of the water named “Bidr,” and came from Persia. There were several others of good standing lines in it, but it was mottled with dark spots. All these swords were light and well-balanced; the most valuable one was the most curved; the steel in all the three tingled like a bell, and is said to improve by age. One test of the genuineness of a sword is that it can be written upon with gold; others, more certain, are its cutting through a large bone, and severing a silk handkerchief when thrown into the air.—Sir Alexander Burnes’ Colost.
WHITEHALL AND HANS HOLBEIN'S GATE-HOUSE.

The Banqueting House at Whitehall is the only remains of the palace occupied as the London residence of the kings of England from Henry VIII. to William III. In the thirteenth century, Hubert de Burgh built a residence here, which he bequeathed to the convent of Black Friars in Holborn. In 1248 the friars sold the place to Walter de Grey, Archbishop of York, and for nearly three centuries it was the town residence of the prelates of that see, Wolsey being its last archiepiscopal occupant. During this period it was called York House. The old palace at Westminster, which had been the seat of the English kings from Edward the Confessor downward, had now become dilapidated; and as soon as Henry VII. had dispossessed the proud and magnificent cardinal, he himself took possession of his official mansion, in which he soon made numerous alterations. An act of parliament, passed in 1536, recites that the king had lately obtained one great mansion-place and house, and that upon the soil and ground thereof he had "most sumptuously and curiously built and edified many, and distinct, beautiful, costly, and pleasant lodgings, buildings, and mansions," and adjoining thereunto "had made a park, and walled and environed it round with brick and stone, and there devised and ordained many and singular commodious things, pleasures, and other necessaries, apt and convenient to appertain to so noble a prince for his pastime and solace." The above act defines the district which should be deemed and called the 'King's Palace at Westminster.' It comprised a space between Charing Cross and the Sanctuary at Westminster, bounded by the Thames on the east and the wall of the palace park on the west. By the time of James I., this palace of Henry's had become unfit for the residence of the sovereign, and in 1606 James commenced pulling it to pieces, intending to erect new buildings, and a large banqueting-room had been already finished, when a fire occurred, in 1619, which was so destructive, that James now determined upon entirely rebuilding the palace, and Inigo Jones was commissioned to make the designs. A ground-plan of his magnificent and extensive design is given in the 'Penny Magazine',

The present Banqueting House, commenced in 1619, and completed in two years, at a cost of 17,000l., was the only part of the proposed edifice which was executed. Whitehall was the residence of James I., Charles I. and II., Cromwell, and James II. William III. resided chiefly at Hampton Court, and his successors, as well as himself, down to her present majesty, resided at St. James's Palace when in town. In 1691 a considerable portion of the royal residence was destroyed by fire, and in 1698 another fire occurred, which proved still more destructive, leaving only the present Banqueting House, and some small buildings, including two gateways.

The history of English politics during a very eventful period is closely connected with the Whitehall of Wolsey and Henry VIII., and the Whitehall of Charles I. and Cromwell. Henry VIII. and Elizabeth exercised their authority with a high hand, and by their firmness rendered the task of a succeeding sovereign in a more inquiring age one of greater difficulty. Yet James I. fully asserted the divine right of kings, and his son Charles I. passed through one of the windows of the present banqueting-room to the scaffold, a martyr to the same high notions of his state.

Whitehall has also its associations connected with the arts. Hans Holbein had apartments in it. One of the two gateways spared by fire in 1698 was always regarded as the design of Holbein. The king was invited to Sir Thomas More's house at Chelsea, which contained a number of the painter's works, with which Henry was so much gratified, that he took Holbein into his service, gave him an apartment in Whitehall, and a pension, besides paying him for his pictures. Holbein was an architect as well as a painter, and though no actual proof exists that the gateway was really designed by him, yet there is no reason why tradition in this case should not be considered as an echo of the truth. Stow speaks of "the beautiful gate-house
athwart the High Street to St. James's Park, &c; and
Howell, in his 'Londinopolis,' merely copies Stow. It
faced the Horse Guards, and extended nearly to the
Banqueting Hall opposite. We have given a view of
this gate, now in our engraving; and another will be
found in the 'Vetusta Monumenta,' published by the
Antiquarian Society about the middle of the last
century, though unaccompanied by a description. It
was an elegant Gothic structure, built to unite that
part of the palace next the river with the parts ad-
joining the park. In the eighth volume of the Ar-
cologia' there is another account of an unknown
picture, by Holbein. Rubens was invited to Whitehall
first invaded Britain, then natives in many cases
fled to
by Charles I., and through his agency the purchase of
their forests for shelter; and hence the conquerors
were led to destroy the forests, in order to cut off the
weight of a man."

The greater part of that portion which forms the
Bedford Level is supposed, from the nature of the
soil, to have been once a forest. When the Romans
first invaded Britain, the natives in many cases fled
to their forests for shelter; and among them, when the
conquerors were led to destroy the forests, in order to cut off
the shelter afforded to the vanquished. In later ages
the sea broke through the embankments which had been
made on the coast, and not only produced much devas-
tation, but converted the surrounding country to the
state of a morass, because the level was below that of
any outlet by which the water could be reconveyed
into the sea. An unhealthy stagnant surface of putrid
and muddy water, interspersed here and there with
patches of spongy or boggy earth, occupied the site of
cultivated districts. The inhabitants of the towns and

ON DRAINING THE FENS OF THE
EASTERN COUNTIES.

Near the eastern coast of England is a tract of land
which has profited by human industry more perhaps
than any other part of the kingdom. A glance at
the map will show that between Norfolk and Lincolnshire
an arm of the sea enters and forms a well-marked
division between the counties; this arm is called the
Wash: the district of country surrounding this in the
form of a horse-shoe is that to which we here allude.
Whether or not the opinion be correct that muchof

* The draining of the Bedford Level has been already treated
of in a previous number (129), but rather in reference to the
history of the improvements than to the nature of them. A few
passages are nevertheless given here, but only such as seem to
the subject to be understood without reference to the earlier
article.

† 'Natural and Agricultural History of Peat-moss or Turf-

bog.'
villages in these fenny districts could only communicate one town to another by means of boats, and by this mode of communication was rendered difficult by the sledge and slime which covered the ground. The peculiar features, then, of the district seem to have been brought about by two or three causes: 1st, there is a basin or hollow so much below the general level of the ground, that the rain which falls on it cannot find an outlet into the sea; 2nd, there have been inundations of the sea which covered very square leagues of land, and converted the vegetable soil known by several names of peat, bog, turf, moss, or fen; 3rd, there is in some parts a subterraneous soil so porous as to allow sea-water to filter through and keep the substratum always wet. It may also be remarked that the waters from the greater part of nine counties flow through the district in their course to the sea, and that the mouths of the "outfalls," or points of confluence with the sea, have been constantly liable to be choked up by loose sand thrown up by the tides.

To remedy these complicated evils, and to bring this land, distant into cultivation, have been objects of solicitude for centuries. The Fens of Lincolnshire, having derived their marshy character from causes somewhat different from those in operation in the Bedford Level, have been subjected to a different kind of reclamation; and of them we will first speak. As the soil is very excessively flat, and the head of water is very sluggish, marshes were early formed, extending over one-third of the county; and in order to prevent the rivers from the upland depositing their waters in this flat soil, the Romans constructed a large drain, called the Car-dyke, or Fen-dike, to convey the waters by the shortest route into the sea. By degrees a portion of fenny country became drained by the efforts of private individuals, and grants were made of portions of fenny land to individuals, on condition of their securing the rivers and draining off the superfluous waters. Another great drain, called the Foss-dyke, was made in the reign of Henry I., as a means both of bringing up vessels from the river Trent to Lincoln, and of draining the adjacent country. The deepening which is meant, not only draining away the water once standing there, but providing a regular outfall for all the water, whether from rivers or rain, which may hereafter flow into or through the district. The water, whether from rivers or rain, which may hereafter flow into or through the district. The drains and canals which have been made are most numerous, and have cost an enormous sum of money.

Many parts of the Cambridgeshire and Lincolnshire fens are so situated, that, notwithstanding the abundant water afforded by improved drains, the water cannot find an outlet, in consequence of being confined in a basin or depressed spot surrounded by high ground. These would have either to be abandoned as irreclaimable marshes, or must have a permanent system in operation for lifting all the rain-water which falls there, and employing it to some river which flows beyond the edge of the hollow. The farmers have been accustomed to dig trenches or drains for the reception of the rain-water, as it flows over the surface of the ground; and from these it has been elevated by a kind of windmill to a height sufficient for transferring it to some stream which flows into the sea. It has often happened, however, that when the rain falls in greatest quantity, there is no wind to turn the mill; and this led to the employment of a steam-engine for a similar purpose. Mr. Glynn communicated to the Society of Arts, about six years ago, an account of the mode which he adopted in draining the fens by steam, and of the success which attended his system. In one fenny spot he had two steam-engines, to effect a drainage which had required forty-four windmills. Mr. Glynn found that in most cases the fenny
spots were so little depressed below the level of the level of the ground as to render the compaction of the earth unnecessary.

At the surface; the propitious situation of the weights W, or the regulating weights attending this mode is the saving of expense, no horses required, no oil.—Companion to Almanac for 1842.

According to the depth of the pit, and the quantity laid which its impulse is derived; the wheels, in fact, standing still or carts being required. From the peculiarity of the system, it is remarkable that the balance consists, in both the balances here represented, of a very thin piece of steel, with an outer rim of brass firmly attached to, and forming one piece with it. The method of making these compound balances is one of the most curious in our metallurgical manufactures. A circular piece of steel, of the size of the intended balance, is turned perfectly true, and perforated in the centre with a small pivot-hole. It is then put into a melting-pot with a small quantity of fine brass, which, when melted, completely covers it. The brass is subsequently filed away from the sides and partially from the edge, so as to leave nothing but a ring of brass, which must be perfectly united to the steel at every point. The whole is then carefully condensed with a hammer or burnisher, and the steel is turned away from the centre, and the brass from the outside, so as to leave nothing but a thin compound ring, in which the brass part is about twice as thick as the steel. The steel from the centre is not entirely removed in this operation, a thin bottom being left, out of which the bar A B is cut. The removal of the superfluous parts of this bottom, and the cutting through of the compound ring at a b, complete the formation of the balance itself. The balance is then loaded, either by sliding weights, as in fig. 1, or by a number of small screws, as in fig. 2, which may be screwed in more or less, as circumstances require. The screws C C, called mean-time screws, regulate, by being screwed in more or less, the rate of the chronometer, but have nothing to do with the compensation for changes of temperature. This is effected on the principle before described, the compound rim curving inwards, and thereby diminishing the centrifugal force of the balance, when the balance-spring is relaxed by heat, or expanding, and thereby producing the contrary effect, when the spring is warmed by cold.

The proper situation of the weights W, or the regulating screws 1, 2, 3, 4, is ascertained by experiment, the amount of compensation being greater the nearer the weights are to the free ends of the rim, in the balance represented by fig. 1; while in the other form the like effect is produced by making the screws project more or less.

One of the most recent improvements in chronometers has been invented and patented by Mr. Dent, and consists in coating the balance and balance-spring with a compound ring, in which the brass part is about twice as thick as the steel. The steel from the centre is not entirely removed in this operation, a thin bottom being left, out of which the bar A B is cut. The removal of the superfluous parts of this bottom, and the cutting through of the compound ring at a b, complete the formation of the balance itself. The balance is then loaded, either by sliding weights, as in fig. 1, or by a number of small screws, as in fig. 2, which may be screwed in more or less, as circumstances require. The screws C C, called mean-time screws, regulate, by being screwed in more or less, the rate of the chronometer, but have nothing to do with the compensation for changes of temperature. This is effected on the principle before described, the compound rim curving inwards, and thereby diminishing the centrifugal force of the balance, when the balance-spring is relaxed by heat, or expanding, and thereby producing the contrary effect, when the spring is warmed by cold.

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Froissart's description of the latest and most interesting of those great events which shed so much lustre over the English campaigns in France, the battle of Poitiers, may be safely taken altogether as one of the most picturesque and dramatic descriptions of a battle ever written. This is no doubt in some measure owing to the very interesting character of many of the incidents, although it must be remembered that the very choice of such incidents is a feature which preeminently distinguishes Froissart from all the other old chroniclers; but this is not all. Froissart rises with his theme; and he now becomes a kind of distant eyewitness of what he describes. We do not mean that he was positively within view of the scene at Poitiers, but he was probably at no great distance, and was certainly immediately afterward in communication with those who had been distinguished actors in it. Up to the time of this battle, in 1356, Froissart principally derives his information from the chronicles of John le Bel, canon of Liege, whose principal informist is understood to have been John of Hainault; but beyond that period Froissart collects his materials for himself, and is constantly travelling with that express object. We may read him, therefore, with the conviction that whilst he is the most amusing and informing of historians of his class, he is at the same time the most faithful.

From the period of the siege of Calais to that of which we are about to speak, the chief events may be briefly passed over. A truce for six years was agreed to, which was but indifferently kept on either side. Whilst it lasted, offers were made on the part of Edward to renounce all pretensions to the throne of France, if King John would yield the absolute sovereignty of Guienne, Calais, and the other territories which had been held by former English monarchs as fiefs. John consented, but his people were most indignant, and would not ratify the arrangement. So in 1355 the Black Prince set out on an expedition from Bourdeaux with sixty thousand men, only a small part of whom were his countrymen. This cruel and ferocious march offers a strange contrast to the gen-

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FROISSART AND HIS CHRONICLE.
No. IV.
THE BATTLE OF POITIERS.
men lodged in a strong place among hedges, vines, sides. In the main the French king demanded that array and power of the English, said on their return, mirable use of the time, strengthening the hedges, “Sir, we have seen the Englishmen; by estimation and widening and deepening the dykes. At sunrise they betw...
find none accord in the French king. The Prince simply and cheerfully answered, "The same is our intent and all our people: God help the right." As the Cardinal disappeared, the Prince turned to his men, and thus addressed them: "Now, Sirs, though we be but a small company, as in regard to the puissance of our enemies, let us not be abashed therefore; for the victory lieth not in the multitude of people, but whereas God will send it. If it fortune that the journey be ours, we shall be the most honoured people of all the world; and if we die in our right quarrel. I have the king, my father, and brethren, and also ye have good friends and kinsmen: these shall shield us. Therefore, Sirs, for God's sake require you do your devoirs this day; for if God be pleased, and Saint George, this day ye shall see me a good knight." And, continues Froissart, "These words and such other that the Prince spake comforted all his people."

The battle began on all sides as the revellations of the Marshal of France approached, evidently in order to break the array of the archers. "They entered on horseback into the way where the great hedges were on both sides set full of archers. As soon as the men-of-arms entered, the archers began to shoot on both sides, and did slay and hurt horses and knights; so that the horses, when they felt the shafts they would go wise go forward, drew back, and flung, and took on so fiercely, that many of them fell on their masters, so that for the press they could not rise again, insomuch that the Marshal's battle could never come at the Prince. Certain knights and squires, that were well horsed, passed through the archers, and thought to approach to the Prince; but not within an hundred space, the Marshal's battles were discomfited, for they fell one upon another, and could not go forth; and the Frenchmen that were behind, and could not get forward, recoiled back and came on the battle of the Duke of Normandy, the which was great and thick, and were afoot. But anon, they began to open behind; for when they knew that the Marshal's battle was discomfited, they took their horses and departed, this might best; also they saw a rout of Englishmen coming down a little mountain a-horseback, and many archers with them, who broke in on the side of the Duke's battle."

"True to say, the archers did their company that day great advantage, for they shot so thick, that the Frenchmen wist not on what side to take heed; and, little and little, the Englishmen won ground on them; and when the men-of-arms of England saw that the Marshal's battle was discomfited, and that the Duke's battle began to disorder and open, they leaped then on their horses, the which they had ready by them. Then they assembled together, and cried, 'Saint George for Guienne;' and the Lord Chandos said to the Prince, 'Sirs, take your horse and ride, for then this journey is yours. God is this day in your hands—get us to the French king's battle, for there lieth all the sore of the matter. I think verily by his valiantness he will not fly; I trust we shall have him, by the grace of God and Saint George, so be well fought withal; and, Sir, I hear you say that this day I should see you a good knight.' The Prince said, 'Let us go forth; ye shall not see me this day return back;' and said, 'Advance, Banner, in the name of God and Saint George!' The knight that bare it did his commandment; there was then a sore battle and perils, and overthrown, and he that was down could not be relieved again without great success and aid. As the Prince rode and entered in among his enemies, he saw on his right hand, in a little bush, lying dead, the Lord Robert of Duras, and his banner by him. Then the Prince said to two of his squires, and to three archers, "Sirs, take the body of this knight on a targe and bare him to Poitiers, and present him from me to the Cardinal of Perigord, and say how I salute him by that token: and this was done.'

This striking incident, which forms the subject of our paragraph, needs a word of explanation, which we may here, with Froissart, pass to. The Prince was informed that the Cardinal's men were on the field against him, the which was not pertaining to the right order of arms, for men of the church, that cometh and goeth for treaty of peace, ought not by reason to bear harness, nor to fight for neither of the other arms: Thus, the Prince's embassy was therefore at once a most significant reproach and comment on the head of the Cardinal's men, the Châtelain of Amposta, narrowly escaped a worse fate than the Lord Duras being taken prisoner, the Prince ordered him to be beheaded, but the famous warrior Sir John Chandos succeeded in obtaining an arrest of the order.

Afghan Irrigation.—Immediately on crossing the river of Ghourland, we entered Kohistan Proper, a country rich without parallel. It is of no great extent, its form being that of a segment of a circle, the length of which is about sixteen or seventeen miles, and five or six miles in its greatest width. The fertility and productiveness of the soil is equalled by the industry of the people, who, forming banks above banks, acquire, as it were, land from their stony hills, all of which they irrigate with a care and industry greatly to be admired. Aqueducts are cut in the rock, and sixty feet up the hill, conducted round every swell and valley, till at last they pour out their contents on the embanked fields. Irrigation from natural rivulets is of course more economical than by canals or subterraneous water-courses. The canals are either dug by the government or by the inhabitants themselves, and are pointed generally to the value of the result, may be preparing the way for the proceedings of those who live higher up, and even to bribe them not to damage their fields by stopping the supply. For one night's supply to a crop of twenty khurwars, from fifty to a hundred rupees are sometimes given.—Sir Alexander Burnes' Cabool.

No Inquiry without its Use.—It seems to be a necessary condition of human science, that we should learn many (apparently) useless things in order to become acquainted with those which are of service; and as it is impossible, antecedently to experience, to know the value of our acquisitions, they only come to be of any practical use, when we find that some kind can secure all the advantages of knowledge to prosecute their inquiries in every possible direction. There can be no greater impediment to the progress of science than a perpetual and anxious reference at every step to palpable utility. Assuredly that the general result will be beneficial, it is not wise to be too solicitous as to the immediate value of every individual effort. Nor is it to be forgotten that trivial and apparently useless acquisitions are often the necessary preparatives to important discoveries. The labours of the antiquary, the verbal critic, the collator of mouldering manuscripts, the describer of microscopic objects (labours which may appear to many out of all proportion to the value of the result), may be preparing the way for the achievements of some splendid genius, who will combine with minute details into a magnificent system, or evolve from a multitude of particulars, collected with painful toil, some general principle destined to illumine the career of future ages. To no one perhaps are the labours of his predecessors, even when they are apparently trifling or unimportant, of more service than to the metaphysician; and he who is well acquainted with the science can scarcely fail to perceive that many of its inquiries are gradually converging to important results. Unaltered as they appear to present utility, it is not prudent to say that we should hereafter be indebted to them for the extirpation of many miscarriage, and the correction of a great part of those loose and ill-founded opinions by which society is now pervaded.—Essays on the Formation and Publication of Opinions.
THE CHESTNUT.

The edible chestnut is not so common a tree as the horse-chestnut, with which it is often confounded, and both Gerard and Evelyn treated of the two in the same chapter. The former tree is more nearly allied to the beech, and was classed by Linnaeus in the same order; but the flowers are differently formed, and the nut of the former is farinaceous, while the beech nut is oily. In the system of modern naturalists the sweet chestnut constitutes a distinct genus. The leaves are long, terminating in a point, with the edges indented, and of a rich shining green, and the flowers are of a greenish-yellow. The nut is surrounded by a husk strongly armed with prickles. The chestnut was brought from Sardis, in Asia Minor, and planted in Greece several centuries before the Christian æra. The Romans obtained it from the Greeks, and called its fruit the Sardis nut. With the extension of the Roman empire the chestnut was introduced into most parts of Europe. A controversy was carried on during the last century, as to whether the edible chestnut was indigenous in England, but it appears to have been determined in the negative. It is most abundant in the south of France, in Switzerland, and particularly in Spain and Italy, and is generally found on slopes where the corn-lands terminate. The wild chestnuts on Mount Etna are some of them of stupendous size, and one measured by Brydone was found to be two hundred and four feet in girth. It appeared as if the trunks of five distinct trees had grown together, but on closer examination there seemed reason to believe that they were once united. This tree bears the name of Castagno del cento cavallo, on account, as they say, of its being capable of sheltering a hundred horsemen. The natural region of the chestnut is co-extensive with that of the vine, beyond which limits its fruit does not always arrive at perfection. It is not found in Denmark, Sweden, or Norway. In Ireland the fruit does not ripen at all, and but seldom in Scotland. The quantity of English-grown chestnuts for sale is comparatively small, the chief supply being obtained from Spain, from which we import about thirty thousand bushels annually, paying a duty of two shillings per bushel. The trees which produce the best fruit are varieties improved by cultivation and by grafting, and the quality accordingly differs as widely as the crab from the apple.

When Evelyn published his 'Sylva,' in 1664, the potato was scarcely known as an article of food, and he strongly recommended the cultivation of the chestnut for the sake of its fruit, which, he says, is "a lusty and masculine food for rustics at all times, and of better nourishment for husbandmen than coles (cabbage) and rusty bacon, yea, or beans to boot;" but, he observes, "we give that fruit to our swine in England which is amongst the delicacies of princes in foreign countries." He then describes the different foreign modes of preparing chestnuts for the table:—"They boil them in Italy with their bacon; and in Virgil's time they eat them with milk and cheese. The best tables in France and Italy make them a service, eating them with salt, in wine, or juice of lemon and sugar, being first roasted in embers on the chaplet; and doubtless we might propagate their use among our common people, being a food so cheap and lasting.
In Italy they boil them in wine, and then smoke them a little; those of Piedmont add fennel, cinnamon, and nutmeg to their wine; but first they peel them. Others macerate them in rose-water. The bread of the flour is exceedingly nutritious." Gerard, in his 'Herbal,' published in 1597, says:—"Some affirm that of raw chestnuts dried, and afterwards turned into meal, there is made a kind of bread, yet it must needs be that this should be dry and brittle, and hardly con- coccted;" and he correctly states that it is not very digestible. Mr. Loudon, in his 'Arboretum,' has given an account of the present modes of preparing the chestnut for food in the south of Europe. Besides the ordinary method of roasting, the flour is made into cakes, and into a thick porridge and soup. The former, called la galette, "is a species of thick flat cake, which is made without yeast, and baked on a kind of girdle or iron plate, or on a hot flat stone. It is generally mixed with milk and a little salt, and is sometimes made richer by the addition of eggs and butter; and sometimes, when baked, it is covered with a rich custard before serving." The porridge termed la polenta is made exactly in the same manner as oatmeal porridge, either with milk or water. A mess resembling mashed potatoes is also made by boiling the chestnuts whole in water with a little salt, until they become soft. These are the common modes of preparing the chestnut where it constitutes, as in parts of Spain, Italy, and the south of France, the ordinary food of the peasantry, serving as a substitute for bread and the potato. The confectioners on the Continent make a sweetmeat of the fruit by first cooking and then dipping the nuts in clarified sugar. In Paris the street vendors of chestnuts are as numerous as the sellers of hot baked potatoes in London.

In Evelyn's time, and long afterwards, it was generally believed that the timber found in some of our most ancient buildings was the wood of the chestnut: in consequence of this belief it was extensively planted, and the Society of Arts encouraged its cultivation by gifts of medals. It is now well ascertained that the chestnut is of little value for timber, and, unlike other trees, it is more durable before it has reached maturity than at any subsequent period. The small quantity of sapwood in young trees renders it very useful as coppice-wood. It is true that the chestnut bears some resemblance to oak timber, and this occasioned the ancient belief of old oak to be mistaken for chestnut. Mr. Loudon states that the latter may be distinguished from oak "by the transverse fibres being more confused and much less evident to the naked eye." It is used for making tables, stools, chairs, chests, bedsteads, tubs, and vessels for holding liquids, for which latter purpose it is said to be superior to other trees, on account of its neither shrinking nor swelling. The same quality renders it well adapted for water-pipes. Posts for gates and fences made from the wood of trees which had not reached maturity have lasted longer than the oak. The chestnut is also extensively used for hop-poles.

In England the chestnut is grown for ornament rather than use. It flourishes in a deep light loam, in a sheltered situation, and is said to have been planted in 1597 on Studley Park, near Ripon: it is one hundred and twenty feet high; at one foot from the ground the trunk is seven feet in diameter, and the diameter of the head is ninety-one feet six inches; but trees of the average size have a stately and noble appearance, something between the oak and the ash. The foliage hangs in a loose, graceful, and ornamental style, and in autumn glows with the brightest hues of that rich pictorial season. The odour of the flowers is not considered pleasant by some persons, on which account the chestnut should not be planted close to the house. Salvator Rosa has introduced the chestnut into many of the wild-looking scenes which he loved to depict.

ON THE EFFECT OF OIL IN STILLING WAVES.

Among the statements made by Pliny, in his 'Natural History,' eighteen centuries ago, was one which has obtained but little credit until modern times, although now no longer doubted. It relates to the effect of a thin stratum of oil in stilling waves. Pliny mentions this property as having been known to the divers of his time; they poured a little oil on the surface of the water, in order that, by stilling its ripplings, the rays of light might be better able to penetrate to the bottom. About seventy years ago the subject was much discussed by several Fellows of the Royal Society, including Dr. Franklin; and subsequent inquiries have shown that the property in question is familiarly known to maritime men in different countries. We will first enumerate a few facts collected from various quarters; and then describe some experiments which Franklin made on the subject.

Sir Gilfred Lawson, who served in the British army at the defence of Gibraltar, told Dr. Brownrigg that the fishermen of Gibraltar were accustomed to pour a little oil on the sea, in order to still its motion, that they might be enabled to see the oysters lying at its bottom: Sir Gilfred had often seen this done. Dr. Franklin was informed that many of the divers on the coast of Italy were accustomed to take a little oil in their mouths before they dived; when they had descended to a certain depth, they allowed the escape of the oil, which, rising to the surface by virtue of its lightness, spread in a thin film, which smoothed the
water-ripples, and allowed light to descend to a con-
siderable depth. The fishermen of Lisbon, when
about to return into the river, if they saw before them
too great a surf upon the bar, were accustomed to
empty every one of two or three oil-chips across
their bows. Sir John Pringle was informed that the
persons employed in the herring fishery off the coast
of Scotland could see at a distance where the shoals of
herrings were, by the smoothness of the water over
them, occasioned, as he supposed, by some kind of
oiliness proceeding from the bodies of the fish. It had
been observed by the seal-catchers on the coast of
Scotland, that when these animals are devouring a
very oily fish, which they do under water, the waves
above become remarkably smooth.

A passenger to the Eastern ocean in a Dutch ship,
in the year 1770, wrote a letter to a Count Bentinck,
in which the following statement was given:—Near
the islands Paul and Amsterdam we met with a storm,
which had nothing particular in it worthy of being
communicated to you, except that the captain found
himself obliged, for greater safety in wearing the ship,
to pour oil into the sea, to prevent the waves breaking
over her; which had an excellent effect, and succeeded
in preserving us. As he poored out but a little at a
time, the waves did not reach the bottom of the bows
to only six demi-ounces of olive oil. I was present
upon deck when this was done; and I should not have
mentioned this circumstance to you, but that we have
found people here so prejudiced against the experi-
ment, as to make it necessary for the officers on board,
and myself, to give a certificate of the truth on this
point of which we made no difficulty.

The incident which first drew Franklin's attention
to the subject he thus narrates:—“In 1757, being at sea
in a fleet of ninety-six sail bound against Louis-
bourg, I observed the wakes of two of the ships to be
remarkably smooth, while all the others were ruffled
by the wind, which blew fresh. Being puzzled with
the differing appearances, I at last pointed it out to
our captain, and asked him the meaning of it. ‘The cooks,’
said he, ‘have, I suppose, been just emptying their
greasy water through the scuppers, which has greased
the sides of those ships a little!’ and this answer he
gave me with an air of some little contempt, as to a
matter that everybody else knew. In my own mind I at
first slighted his solution, though I was not able to think of another.”

Franklin, however, was not a man to let such an
inquiry drop till he had arrived at some satisfactory
conclusion. He conversed with maritime persons on
the matter, and found that the effect of oil in stilling
waves was known to many of them. He resolved,
therefore, to make experiments for himself, and se-
lected a pond on Clapham Common as the locality.
He dropped a little oil in the water, and says, “I saw
it spread itself with surprising swiftness upon the
surface, but the effect of smoothing the waves was not
produced; for I had applied it first upon the leeeward
side of the pond, where the waves were largest, and
the wind drove my oil back upon the shore. I then
went to the windward side, where they began to form;
and there the oil, though not more than a tea-spoonful,
produced an instant calm over a space several yards
square, which spread amazingly, and extended itself
greatly till it reached the leeside, making all that
quarter of the pond perhaps as smooth as a looking-glass.” He describes the film of oil as
being reduced to such extreme thinness as it spread,
as to give out the prismatic colours, and afterwards
to be quite invisible except in relation to the stilling
effect which it produced.

After this experiment, Franklin adopted an expe-
dient quite characteristic of his untiring love of in-
quiry into natural phenomena: he contrived to hollow
out the upper joint of his bamboo walking-stick, and
put a little oil in it whenever he was going into the
country; he was thus enabled to repeat the experi-
ment many times, and always produced the same
effect. During a visit which he afterwards paid to the
celebrated Smouton, Franklin was told by a Mr. Jessop,
a pupil of Smouton's, that having thrown into some
water a few flies which had been drowned in a cup con-
taining oil, he was surprised to see the flies presently
begin to move and rotate rapidly on the water, as if
there were alive, though on examination he found
them to be quite dead. Franklin had before observed that
the oil on the surface of water seems to be endowed
with a kind of repulsive action among its particles,
which acted also on any light substances, such as
straws, leaves, or chips floating on the surface; and
he conceived that the flies rotated in consequence of a
repulsion exerted as the oil oozed from their bodies.
He showed that organised structure had nothing to do
with the matter, for he produced similar movements
by placing on the surface of water small oiled chips
cut into the form of a comma (,) as the oil issued from
the point of the comma, the chips began to rotate.

The explanation which Franklin offered of the sedi-
tive effect of the oil upon waves was very ingenious.
Air, when in motion, in the shape of wind, over the surface
of smooth water, probably rubs, as it were, on that sur-
face, and raises it into wrinkles, which, if the wind con-
tinues, are the elements of future waves. The smallest
wave, once raised, does not immediately subside and
leave the neighbouring water quite smooth; in its motion
itself is converted into a wave, which, as it moves
steadily forward, continues, is the element of future
waves. Thus the very oily fish, which they do
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The explanation which Franklin offered of the sedi-
tive effect of the oil upon waves was very ingenious.
Air, when in motion, in the shape of wind, over the surface
of smooth water, probably rubs, as it were, on that sur-
face, and raises it into wrinkles, which, if the wind con-
tinues, are the elements of future waves. The smallest
wave, once raised, does not immediately subside and
leave the neighbouring water quite smooth; in its motion
itself is converted into a wave, which, as it moves
steadily forward, continues, is the element of future
waves. Thus the very oily fish, which they do
underwater, the waves the oil on the surface of water seem to be endowed
with a kind of repulsive action among its particles,
which acted also on any light substances, such as
straws, leaves, or chips floating on the surface; and
he conceived that the flies rotated in consequence of a
repulsion exerted as the oil oozed from their bodies.
He showed that organised structure had nothing to do
with the matter, for he produced similar movements
by placing on the surface of water small oiled chips
cut into the form of a comma (,) as the oil issued from
the point of the comma, the chips began to rotate.
experiment on this point at the entrance of Portsmouth Harbour, nearly opposite Haslar Hospital. A party left a ship, in the long-boat, and took up a position a quarter of a mile from the shore, with a wind blowing towards shore; another party were in the barge at double that distance from the shore; while a third party watched the effects from the shore itself. The experimenters in the barge made trips too and fro, of about half a mile each, parallel with the shore; pouring oil continually out of a large stone bottle, through a hole in the cork somewhat larger than a goose-quill. It was found that the height and motion of the waves were not materially lessened; but the persons in the long-boat could observe a tract of smoothed water, extending the whole length of the distance in which the oil was poured, and gradually spreading in breadth from the track of the barge towards the long-boat. This portion of sea was not levelled, but it was free from the small wrinkles usually observed on the waves themselves, and also totally free from the foam exhibited in similar situations. The men in a sailing-boat, which happened to be passing that way, purposely chose that tract which had been smoothed by the oil, as being more calm and easy of navigation. As a consequence, the former had not the effect of destroying the waves themselves, it reduced them to calm and gently swelling undulations. When the wind blows fresh, there are continually rising on the back of every great wave a number of small waves, which roughen its surface, and give the wind a kind of hold or purchase to push it with. In some cases the larger of these waves, although it cannot stop powerful waves already formed, which acquire a power of oscillation totally independent of the continuance of the wind, will prevent the formation of the subordinate waves which increase the bulk and force of the former.

We are not aware whether any recent attempts have been made to apply this curious principle to any useful purpose.

ROADS AND ROAD-MAKING IN THE UNITED STATES.

[From a Correspondent.]

It is hardly to be expected in a country so new, comparatively, as the United States, where considerably the larger portion of the present inhabited territory was an uninterrupted forest or wilderness half a century ago, that the generality of the roads should be as good and complete as the roads of older, wealthier, and more densely populated countries.

The earliest made, and consequently the oldest class of roads in the United States, are the state roads; so called from their being originally made at the cost of the respective states through which they pass. A road of this description will often be found passing through vast tracts of country wholly uninhabited, and until a portion of the adjacent country becomes settled, there are comparatively few travellers passing along such lonely routes, so that the roads are very little injured by the traffic upon them. Indeed they are rather looked upon as mere outlets from one part of an extensive territory to another, and therefore are only presumed to be frequented by persons whose business imperatively calls them to a distance from the reclaimed portions of the country. It frequently happens that one of these roads will intersect the entire length or breadth of a state; nor will it probably be allowed to terminate at the extreme boundary thereof, for the adjoining state or territory may be induced to continue the line as far as its limits permit, and a third and a fourth state may by chance continue the same route.

The plan adopted in making these roads is not calculated to induce the traveller to frequent them, if there is not an absolute necessity for his doing so; for the best way of grubbing up the wood and the trees happen to grow along the line, and cutting down the smaller trees and brushwood, little more is done than opening an irregular ditch on either side, and filling up the holes or inequalities of the surface with the soil taken therefrom; the width (which is rarely more than twelve or fourteen feet) varying according to the obstacles which may happen to present themselves on either hand. Where small creeks or streams are fallen in with, rude wooden bridges are constructed across them; but when a stream or river of considerable size interferes with the route, no attempt is made at throwing a bridge across it, the state authorities preferring to leave it to the ingenuity of the traveller to find out some plan of reaching the opposite side.

Since this class of roads has little care or attention paid at the time of construction, even where one of them is the least frequented, it is liable, in the course of a few years, through the action of the frost during winter, and the washing of heavy rains at other seasons, to get so much out of order as to render it almost impassable; while the conduits and bridges, being constructed of perishable timber, ten or a dozen years is an abundantly sufficient period for most of them getting completely out of repair. And since it rarely happens that the state authorities ever look after them when once they have been constructed, and as no tolls are collected, nor taxes levied to keep them in repair, it is evident that the largest states of all they will possess few of the attributes of a road, save the original name.

However, as the lands in the localities through which such roads pass become taken up, or settled upon, it is by no means unusual for these roads, or sections of them, to be taken possession of by the inhabitants, repaired, and converted into township roads—a class of roads made and maintained by the respective townships through which they pass, and for the making or improving of which the inhabitants of each township voluntarily tax themselves. But since cash in most new countries or settlements is a scarce article, the road-taxes are usually paid in a specified amount of money annually. When performed upon these roads intersecting the township in which an occupier's farm is situated, who is moreover commonly allowed to work out his tax upon the particular line of road with which his lands are most immediately connected. These roads are, however, for the most part, but mere passable tracks; especially in the newer sections of the states, being made at a small expense, the condition of the settlers not allowing of much outlay upon roads, either in the form of money or labour.

Considering the great extent of country, there are comparatively few turnpike-roads in any part of the United States, and only one of any considerable extent, belonging to the nation at large. The road here alluded to is the one commencing at the City of Washington, and from thence running westward through a portion of Virginia, thence across the Ohio river, and so traversing the several intervening states lying between that river and the Mississippi. It is called the Great Western, or National Turnpike Road, and is undoubtedly the greatest undertaking of the sort in America. But the various states, individually, have entered more or less into the spirit of road-making, and as these roads (except the state roads already spoken of) come under the denomination of turnpikes, a separate notice becomes necessary.

Turnpike-roads—that is, such roads as toll-bars or toll-gates are established upon, at which tolls are collected—are never made in the United States, except
under an express act or charter from the legislature of the respective state to which these roads belong. During the last quarter of a century or more, in most parts of the Union, the people have been unceasingly clamorous for improvements. These comprehended the construction of canals and the improvement of the channels of creeks and rivers, as well as the making of turnpike and rail roads. Some of these undertakings are performed exclusively at the expense of the state, while others—and particularly the roads—have been commonly undertaken by companies who have supplied the funds for the completion of the works, as to threaten the existence of their property, or at least a continuance closely bordering upon bankruptcy.

It is not a little surprising that through many of the older and more populous districts, and on routes connecting some of the principal cities, the roads are still in a very poor condition, few of them being anything more than township roads; and where turnpike trusts exist, they are but little better than few of the lines are macadamised, or made after the manner we find them in England. Indeed, when it is stated that on few of the lines of turnpike-roads which have been made, even in portions of the country where the ground is rough and hilly, has the cost of making exceeded ten or twelve hundred dollars per mile (from 200l. to 240l. sterling), and this too where wages are very high, it will be readily perceived that they cannot be very perfect or finished performances. The mode of making them is this:—where the ground is free from trees and stumps, the whole of the sites of the intended road is ploughed up lengthwise, or in the direction it runs, and afterwards the whole is turned, or scraped towards the centre or crown of the road. After the arched mound of earth has been raised sufficiently in this way, and the whole has been rendered tolerably smooth by means of hand-hoes, the work is considered finished. But in the forests the trees have first to be grubbed up, and the immense roots rolled out of the way on either side; when the soil is afterwards loosened by ploughing, as has already been stated. But a stronger plough is now employed, and a more powerful team is required to perform the task. In many situations the ground is so marshy and waterlogged that the nature of it will not admit of any traffic passing over it, and instead of using better and more durable materials, the forest-trees are cut into proper lengths, and then, without any hewing, squaring, or even baking, laid side by side—crosswise on the line of roads in what is called the corduroy plan of road-making. Sometimes a little soil is brought from wherever it can be had, to fill up the hollows between the arches of the logs, but this is commonly soon worn or washed away, when the logs present a wearisome succession of narrow ridges to the unfortunate traveller. The traveller is indeed the one who has to journey over several miles of "corduroy turnpike," since it is with difficulty that the nimble-footed horses bred in the new settlements manage to perambulate several miles of this description of road without many a false step and stumble; while it is still worse where any sort of vehicle with wheels is employed, since the continual severe jolting is almost sufficient to dislocate the bones, unless they be more firmly united than is ordinarily the case.

Very few of these turnpike-roads are enabled, by the tolls collected upon them, to be kept in tolerable repair; and still fewer yield any dividends to the state or other stock-holders. Indeed it is nothing uncommon to meet with roads of this description that have been so injudiciously laid out, or so wretchedly constructed, that in a few years after their first being opened they have become so thoroughly out of repair, that the toll-gates have been taken away and the roads thrown open, so that every farthing of money expended upon them has been sacrificed by those who were the expenders of the capital, or of the rate little money which they supplied at the time.

The principle upon which the collecting of tolls is founded, as regards the turnpike-roads in the United State, is different from, and certainly more equitable than, the plan which generally obtains in this country. There the charge is so much per mile for the distance travelled; while here a specific sum is claimed for passing through the turnpike-gate. No matter whether the traveller has used one mile or twenty miles of the road upon which the toll-bar is erected. For instance, a farmer or any other person residing four miles on one side of the turnpike-gate, will, in all probability, on reaching the place of collection, be recognised by the collector, and his demand, without any further inquiry, would be neither more nor less than the small fractional sum, whatever it might be, that the toll upon the four miles of road came to. But if a stranger presented himself, he would be asked how far he had travelled by that line of road, and if he could make it satisfactorily apparent that he had used it only from one to two or more stations, the same sum covering that short distance would be all which he would be required to pay. If, on the contrary, it appeared that the stranger traveller had used the whole extent of road for which the collector could lawfully demand toll, the full amount would then be insisted upon. It is true that toll-collectors are to some extent liable to imposition under such a regulation, but on the whole it is devoid of the severe compulsion attendant upon our own system of taking the full amount of toll where parties travel very short distances upon such lines of road; nor does the custom obtain of allowing the same parties to travel through the gate a dozen times or more in the same day for one payment, as is the case with most of the turnpike trusts in England.

During three or four months, or while hard frosts continue and snow remains upon the ground, so that sleighs or sledges are in general use in the place of wheel carriages, many of the turnpike tolls in the Northern and Eastern states produce but very little revenue; and, at other seasons of the year, a tolerable little amount is usually collected. This is in consequence of the frost and a thick covering of snow hiding all imperfections in the township and by roads, so that most persons—at least such as are familiar with the localities through which such roads pass—prefer driving a mile or two out of their way in order to avoid the payment of a few cents.
A DAY AT A LEATHER-FAC TORY.

The subject of the present article takes us to a part of the metropolis remarkably distinguished for its manufacturing features. Bermondsey has been for many years the principal seat of the leather-manufacture in England, and derives from this circumstance a character and appearance different from those presented by any other district in London. The cause to which this localization seems to be most correctly assigned, is the existence in Bermondsey of a series of tide-streams which, twice in every twenty-four hours, supply a large quantity of water for the use of the tanners and leather-dressers. The construction of Artesian wells has now in some measure diminished the employment of the water from these streams; but the streams still remain, and are still employed by many of the manufacturers.

The processes involved in the fabrication of leather, although in many respects remarkable and interesting, are very little understood beyond the circle of manufacturers and dealers. It is generally known that the avocations of the tanner, the currier, the fellmonger, the tawer, the leather-dresser, all relate in some way or other to the preparation of leather; but the relation which these employments bear one to another is not so well understood. The establishment to which our visit has been made for the purpose of this article, is connected with the production of some only of the various kinds of leather; but we hope to be able to give a general outline of the manufacture as a whole.

Leather has been designated by Dr. Ure as "the skin of animals, so modified by chemical means as to have become unalterable by the external agents which tend to decompose it in its natural state." The gelatinous portion of the skin is made to combine with chemical substances artificially applied, and by this combination the new substance, leather, is produced. The ingredients employed for the conversion of skin into leather are different in different cases, and give rise to various subdivisions of employment in the leather-manufacture. The classification of the different kinds of leather might be made according to the animals whence the skins were obtained, or according to the thickness and quality of the skins, or according to the purposes to which the prepared leather is to be applied; but we think that the purpose of the present article will be better answered by making a classification according to the mode of manufacture; and we shall therefore speak of leather as prepared—1st, by oak-bark; 2nd, by sumach; 3rd, by alum; and 4th, by oil: these four varieties being remarkably distinguished one from another.

The leather prepared by tanning with oak-bark is the hide of the ox, the calf, and the horse, all of which possess sufficient firmness to be applied to the manufacture of shoes, harness, and other articles requiring great strength and durability. The skins prepared by a substance called sumach are principally those of the goat and the sheep; and the leather resulting from the process is morocco leather, for coach-linings, chair-covers, book-binding, ladies' shoes, &c.; and skiver, an inferior leather, for hat-linings, pocket-books, workboxes, toys, and other cheap purposes. The skins dressed in alum are principally those of the kid, the sheep, the lamb, and in some instances the calf; and the leather produced is principally employed for gloves and ladies' shoes. Lastly, the skins dressed in oil are those of the sheep, the buck, and the doe,
and the resulting leather is that of which riding-gloves and similar articles are made, as well as the soft wash-leather, or shamoy leather, familiar to every one.

Although the processes whereby these varieties of leather are produced differ very distinctly one from another, yet the establishments wherein they are conducted present a generally similar appearance. The tan-yards and leather-manufactories of Bermondsey each present to the view of a stranger an open court or yard surrounded or partially surrounded by buildings, some of which are so constructed as to admit the access of air to every part of the interior. The surface of the court or yard is in most cases intersected by pits, or square cisterns, in which the skins are steeped during some part of the manufacturing process. All bears a general resemblance to each other, but is not altogether attractive to visitors, viz., the presence of unpleasant odours, and the absence of cleanliness.

1. Leather prepared by Tanning.—When an ox has been slaughtered, the hide removed, and the flesh transferred to the butcher, the hide is sold to the tanner, by him to be converted into the thicker kinds of leather, as boots, gloves, &c.; the horns attached; and he separates these from the hide, and sells them to the comb-makers and other manufacturers of horn. The hair is also attached to the hide, but the removal of this is a more difficult operation.

When the hide is purchased by the tanner, there are little bits of flesh, &c. adhering to the inner surface; and he first commences a process whereby the pores are opened and prepared for the reception of the tan afterwards to be applied. The hide is spread out over a convex wooden bench called a 'beam,' and then scraped with knives of a peculiar shape, by which all extraneous matters are removed, and the hide is pared down to the cutis. After this process the hair is to be removed, and this is effected in one of two ways, according to the nature of the animal. One method consists in mixing together quick-lime and water, and immersing the hide in the solution; after remaining there several days, and having the lime-water renewed occasionally, the bulbous roots of the hair have become so far loosened by the action of the lime, as to be easily pulled out. The hide is then spread out on the beam, and 'unhairesd,' that is, scraped with a knife till the hair is removed. In the other method, adopted in some kinds of leather, which would be injured by the action of lime, several skins or hides are placed in a close chamber, where they undergo a kind of natural fermentation, sufficient to loosen the hair from the skin.

When by either of these methods the hair has been removed, the hide is 'grained,' or scraped, and then subjected to a process in the holes of which the pores are opened and prepared for the reception of the tan afterwards to be applied. In some cases this consists in steeping the hide for some days in a sour solution of rye or barley flour; in others, the bath is a very weak solution of sulphuric acid in water. The hide becomes swollen, softened, and the pores ready prepared for the reception of the tan.

The bark, the roots, and occasionally the leaves of a considerable number of plants yield, by soaking in water, an astringent solution, usually of a yellowish brown colour. This solution has a peculiar action on the living skin, corrugating and constraining it; and when applied to dead skin, has the property of converting it into leather. These vegetable substances contain a principle called tannin, which is the agent concerned in converting skin into leather. Provided the tannin is obtained, it matters not much to the success of the process what substance yields it; and the tanner, therefore, employs that which is, on the whole, the most effective and the most economical.

To detail the various systems adopted by different tanners would be wholly foreign to our purpose. The process is so slow a one, and the desirability of increased speed so great, that patent after patent is taken out on the subject; and almost every tanner has some process peculiar to his own establishment. We must, therefore, be as general as possible in our few details. When the hide is properly cleaned and brought to the state called 'pelt,' it is ready to be placed in one of the tan-pits. These are generally oblong, rectangular cisterns, whose upper edge is level with the ground, and whose interior is lined with wood. The tanning ingredient, generally oak-bark, is steeped in the cistern of water, and the solution is then technically termed 'ooze.' The hide is in the first instance put into a pit containing nearly-spent ooze, in which hides have already been steeped, and which becomes generally lost more or less of its tanning principle. In this way the hide is frequently stirred and turned to ensure the equalable action of the tan on every part. The hide is then transferred to a pit containing stronger ooze, or else is stratified with crushed bark; several hides being laid one on another, and steeped in water. Whether the hides be placed at once in prepared solution of bark, or have been steeped in a water containing bark, depends upon the system of tanning pursued by the manufacturer, and upon the quality of the hide; but in either case the hides are exposed to renewed portions of the tanning ingredient from time to time, until the tannin has combined intimately with the animal substance. In most tanneries the usual month's duration of steeping is called 'fogging,' a term which, in the case of thin skins, is equivalent to the tan-pit operations. In the other method, adopted in some kinds of leather, the hide is transferred to the butcher, the hide is sold to the manufacturer, and subjected to a process in which the hide is immersed in a solution of brown wood, and is then exposed to the action of tanin the tan-pits until converted into leather.

The hide is next removed, and the hide is 'unhaired,' or scraped, and then subjected to processes. First, the hide is shaven; this is to cause the tanning principle to penetrate into all the pores of the hide from surface to surface; when this is effected, the hide has become transformed into leather. When the hide is tanned, it is hung up in an airy loft, or drying-room; and during the process of drying it is compressed by beating, by pressure with wooden instruments and also by being passed between rollers, which gives it a smooth and dense texture.

The stoutest hides, from bulls, buffaloes, oxen, and cows, are tanned in a way more or less resembling that above detailed, and are then used principally for the soles of boots and shoes. The time employed in tanning a hide for the soles of men's boots in general is from six to twelve months; while a still thicker quality, known as 'butts' or 'backs,' frequently consumes fifteen or eighteen months in the process. The skins of calves, seals, and the lighter kinds of horse and cow skins, are tanned to form the upper leathers of boots and shoes, and are prepared in a somewhat similar, but more expeditious manner. Having been 'unhaired,' they are subjected to a long period of ten days in an alkaline liquor, being at intervals taken out and scraped on both surfaces, by which the lime, oil, and gelatinous matter are forced out from between the pores, and the skin rendered soft, plant, and fit to receive the tanning ingredient. They are then exposed to the action of tan in the tan-pits until converted into leather.

Leather intended for the upper parts of boots and shoes, for saddlers, and for coach-makers, passes into the hands of the currier after tanning, for the purpose of being softened, equalized in thickness, smoothed, blacked, &c. The currier dips the tanned skin in water to moisten it, and then softens the texture by beating it with a 'mace' : this instrument consists of a wooden handle two or three feet long, with a cubical
head at one end. He then places the skin on an inclined plane called a 'horse,' and equalizes the thickness by the aid of a broad, straight, two-handled knife, called a 'cleaner,' which is worked in such a manner as to shave off the superfluous thicknesses of the skin. After this the leather is thrown again into water, and rubbed on the grain or outer side with pumice or grit-stone; whereby the ‘bloom,’ a whitish matter derived from the action of the bark, is removed. The leather is then rendered flexible by being rubbed, first on one side and then on the other, with an instrument called a 'pommel,' consisting of a piece of wood fastened to the hand by a strap on one side, and having on the under surface a number of parallel grooves, which have the effect of bringing the leather to a high state of flexibility. The leather is again scraped with a broad knife, to equalize its thickness and texture. Then, according to the quality of the leather, and the purposes to which it is to be applied, it is dressed with oil, with oil and lampblack, with tallow, &c.; and is polished with rubbers of hard wood.

We now come to those varieties of leather which will enable us to refer more particularly to the establishment selected for our visit on this occasion. The manufactory known as the Neckinger Mills in Bermondsey, owned by the Messrs. Bevington, is one in which nearly all the kinds of leather prepared with sumach, alum, or other substances are manufactured. The gentlemen have allowed us to witness all the processes carried on therein, and we proceed at once to give a general idea of the place and of its arrangements.

In proceeding from Bermondsey Old Church towards the Greenwich Railway, along the Neckinger Road, we arrive at the Neckinger Mills, at a short distance of the railway. Indeed, the latter passes through part of the ground formerly belonging to the manufactory. The term 'mills' is applied because the premises were once occupied by a company formed for the manufacture of paper from straw, and were then known as paper-mills; the water for the manufacture being supplied by the Neckinger tide-stream, which flows past the building twice a day from the greater part of the buildings in a inclined plane called a 'horse,' and equalizes the thickness by the aid of a broad, straight, two-handled knife, called a 'cleaner,' which is worked in such a manner as to shave off the superfluous thicknesses of the skin. After this the leather is thrown again into water, and rubbed on the grain or outer side with pumice or grit-stone; whereby the ‘bloom,’ a whitish matter derived from the action of the bark, is removed. The leather is then rendered flexible by being rubbed, first on one side and then on the other, with an instrument called a 'pommel,' consisting of a piece of wood fastened to the hand by a strap on one side, and having on the under surface a number of parallel grooves, which have the effect of bringing the leather to a high state of flexibility. The leather is again scraped with a broad knife, to equalize its thickness and texture. Then, according to the quality of the leather, and the purposes to which it is to be applied, it is dressed with oil, with oil and lampblack, with tallow, &c.; and is polished with rubbers of hard wood.

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On entering the gates which form the communication from the high road to the factory, we find ourselves in the open yard represented in the frontispiece. In the various parts of this yard are pits, some rectangular, and some circular, used not as tan-pits for tanning skins, but as lime-pits for loosening the hair and wool. Here and there are men employed in drawing, or lifting out the partially limed skins, and in transferring them from place to place. Southward of this yard is another occupied principally by lime-pits similar to the others, and by lines whereon wetted skins are hanging to dry. Around the large or principal yard are ranges of buildings employed for various purposes. In one range are extensive ware-rooms for finished leather of the morocco kind; in another the white leather is contained; over these are drying-lofts, in which the skins are hung at a certain stage in their manufacture. In another part of the premises are the vessels for tanning skins with sumach; in a third the dye-house, where the morocco leathers are dyed; in others are three or four leather-splitting machines, fulling-stocks for shamoyl leather, a rotating vessel for aluminated leather, and various other arrangements, of which we shall speak presently. The large quantity of water forsoakings is conveyed to this yard through several branches to soften them, and then undergo the process of 'breaking,' which is, scraping them on the flesh side to remove the adherent substances which would interfere with the process of tanning. The 'fleshings' and other scraps obtained in processes similar to this are placed on open racks or stages exposed to the air, and when dry are sold to the manufacturers of glue and size; as are likewise the fleshings and other scraps from the thicker hides and skins prepared by the tanner.

Into the lime-pits before noticed a solution of lime in water is conveyed, and the goat-skins, after being fleshed, are allowed to soak therein for four or five weeks. During this time they are frequently 'drawn.'

After this the leather is thrown again into water, and immersing them again: all this has

Supplement.

The goat-skins employed for this purpose are imported from various parts of the world—Switzerland, Germany, Memel, Mogadore in Northern Africa, the East Indies, the Cape of Good Hope, Asia Minor, and other places. The skins from some places are preferred on account of their thickness or good quality; from others on account of their size; while others are purchased according to the supply which may happen to be in the market. The skins are imported with the hair on, and to remove this is one of the first processes of the manufacture. The goat-skins are first soaked in water for several days to soften them, and then undergo the process of 'breaking,' that is, scraping them on the flesh side to remove the adherent substances which would interfere with the process of tanning. The 'fleshings' and other scraps obtained in processes similar to this are placed on open racks or stages exposed to the air, and when dry are sold to the manufacturers of glue and size; as are likewise the fleshings and other scraps from the thicker hides and skins prepared by the tanner.
the effect of causing the lime to act equally on every part of the hairy covering, and the lime-water is renewed once or twice, to aid in producing the desired effect.

When the liming has been carried to such an extent that the hair can be easily pulled out with the finger, the goat-skins are drawn from the pits, and conveyed in wheelbarrows to the 'fleshing-shop,' one of the buildings in the western part of the premises. In this shop are a number of 'beams,' as they are called, consisting of convex work-benches or stools sloping downwards from one end to the other, and supported on a frame or stand. Each goat-skin is laid smoothly on a 'beam,' with the hairy side uppermost; and the workman, standing at the upper end of the beam, scrapes off all the hair by means of a double-handed knife. The convex form of the surface on which the skin is laid, and the peculiar form given to the knife, enable the workman to take off all the hair very completely. The operations of 'fleshing,' of 'unhairing,' and of 'graining,' are so nearly alike in their general appearance, that the annexed cut will sufficiently show the character of the whole; the principal difference being in the edge of the knife employed by the workman. The hair which is thus removed from the goat-skins is, after being cleansed, sold to the carpet-manufacturers and to plasterers.

After the process of 'unhairing,' the goat-skins are again soaked in lime-water for two or three days, and are then again 'fleshed,' or scraped on the inner surface, by which the cut is brought to a tolerably clean state. But the long steeping which the skin has undergone has had the effect of driving the lime into the pores, insomuch that the tanning principle contained in the sumach, after wards to be applied, cannot reach the heart of the skin. The tanning, therefore, cannot be commenced until the lime is moved and the pores opened. The means adopted for effecting this are by far the most disagreeable in the whole range of the manufacture. A solution called the 'pure' or the 'pewer' (having never seen the word written or printed, we must spell it as pronounced), is prepared in a large vessel, and into this the skins are immersed: there is an alkaline quality in the solution employed, which has the effect of removing the lime from the pores, and the manufacturers seem to have failed hitherto in finding more than one substance which yields this quality effectually. Whether chemistry may hereafter afford them a more extensive range it is not for us to say, but such would seem to be at least probable. After being 'pured' for some time, the skins are taken out and scraped well on both sides, for the sake of removing as much of the lime and the albumen as may be removable by these means; and after this they are steeped again.

By these operations the pores of the goat-skin are so far opened and cleared as to prepare them for the reception of the tanning principle. The substance employed in tanning stout hides is, as we before explained, oak-bark; but for goat-skins the tanning ingredient is a vegetable substance called sumach. This is the powder of the leaves, peduncles, and young branches of a plant called the *Rhus coriaria*, growing in Sicily, Italy, and Hungary. It is one of the substances experimented on by Sir H. Davy in his inquiry into the tanning properties of various bodies; and he found it to contain a large proportion of tannin. It contains also a light colouring-matter, which seems to render it useful for the finishing of light-coloured leathers. It is employed extensively in dyeing, as well as in leather-dressing. In the sumach tan-houses at Messrs. Bevington's we saw a pile of this substance, just as imported from Sicily, in cloth bags containing about one cwt. each: when the bags are opened, the sumach appears as a fine yellow powder.

The manner in which this tanning ingredient is forced into the pores of the goat-skin is exceedingly curious. The sumach is mixed with water; but if the skins were immersed indiscriminately in the solution, or even laid smoothly one on another, the sumach would not act equally on the whole surface. To produce the desired equality of action, a finishing singular plan is adopted:--The wet goat-skins are taken from the 'pure,' or alkaline solution, and sewn up by women into bags, each skin forming a bag with the grainside outwards, and having no opening except a small one at that part which had formed the hind shank of the animal. These bags, as soon as made, are thrown into a vessel of water, and examined, to see that they are well sewn up, and free from holes. They are then taken to the sumach-tub, where the process represented in the annexe cut is carried on. A large shallow circular tub, twelve or fifteen feet in diameter, is filled with hot water containing a little sumach, and near it is a smaller vessel containing a strong solution of sumach in water. Two men and a boy, standing on one side of the tub, then fill the bags with the sumach-solution thus: the boy takes a bag, and inserts into its mouth the stem of a funnel, the mouth of which is uppermost. One of the men then nearly fills the bag, through the funnel, with the solution, which he ladles from the smaller tub. The other man takes the bag from the funnel, and by a peculiar action of the breath fills with wind the remaining portion of the interior, and ties up the mouth with string. The air has the effect of distending the bag until quite free
from wrinkles, and also of causing it to float in water. All the bags, after being thus filled, are thrown into the large vessel, and are kept there about three hours, during which time the dye is employed in rubbing the skin, and during this time the number of immersions which the skins undergo, the changes in the solutions to which the skins are exposed, and the time employed in the various parts of the process, are points involving much practical skill, and on which we can say but little. The crimson, the scarlet, the purple, the indigo morocco-leather, all require particular modes of treatment, arising from the qualities of the dyeing ingredients used.

After the dyeing, the skins undergo two or three processes of rubbing; which seem to act somewhat on the principle of currying, by giving a softness and pliability to the leather. This is especially the case in the finishing process, by which the wrinkled appearance is given to the material. Every one knows that the coloured surface of morocco leather has the appearance of having been indented all over by an instrument sharp enough to leave permanent depressions, but not so sharp as to cut the leather. This effect is produced on the smooth goat-skin thus:—The dye-liquid, being forced through the pores of the dyed surface uppermost, and rubs it forcibly with a ball made of some hard wood, such as box. The ball is about the size of a small lemon, and has on its surface a number of fine parallel grooves. As the ball is worked over the leather in the direction of these grooves, it leaves permanent marks thereon, and thus gives rise to the appearance which distinguishes morocco from all other kinds of leather. Nothing can exceed the beauty and flexibility of the morocco leather made from the finest goat-skins: the finishing of the grooved ball makes it very pliable, while the nature of the skin itself gives it great durability and toughness. In the morocco waterroom at the Neckinger, the vivid colours displayed show also that this kind of leather is susceptible of receiving a beautiful dye.

We have before stated that there is an inferior kind of morocco leather, made of sheep-skin. This, under the name of 'imitation' morocco, is largely used for inferior or economical purposes; and though it is inferior to the other kind in suppleness and durability, its superficial appearance is very similar. The process is to this latter fact, combined with greater cheapness, that we may attribute its extensive manufacture. In the manufacture of morocco leather from sheep-skins there are not many points of difference from the analogous manufacture from goat-skins; but it will be necessary to speak briefly of the different states in which the skins come into the hands of the leather-dresser.

There are in Bermondsey about twenty or thirty manufacturers called fellmongers, whose business it is to bring sheep-skins into a certain state of preparation before the leather-dresser commences his operations thereon. The skins from nearly all the sheep slaughterers in London are conveyed to a skin-market in the western part of Bermondsey, and there sold by factors or salesmen, who act for the butchers, to the fellmongers. The skins are bought and sold with the wool on, and the labourers of the fellmongers relate to the separation of the one from the other, and the disposal of the wool to the woolsaplers, most of whom are in Bermondsey, and who then purchase the skins to the leather-dressers and the parchment-makers. The trade of a fellmonger is more dirty and disagreeable than even that of a leather-dresser, on account of the mode necessary to be adopted for the separation of the wool from the pelt. These remarks, so far as the leather-dresser is concerned, apply only to sheep-skins, for the skins of the goat, the kid, the buck, the doe, and one or two other kinds of animals which have a hairy rather than a woolly covering, come into his hands before the hair has been removed; and the process of 'unha'ring' is then effected.

In the manufacture of sheep-skins into 'imitation' morocco, and into roan leather, a routine of operations occurs not very different from that sketched above. Both kinds are prepared by sumach-tanning; and the preparatory and subsequent processes are for the most part similar to those necessary for goat-skin morocco. There are, however, one or two points of difference which must be noticed. The skin of the sheep, from the organization which promotes the rapid growth of the fleece, contains a much larger amount of oily or oleaginous matter, than the skin of the goat; and it is essential that this be removed before the tanning principle is brought to act upon the skin. To effect this, the skins, shortly before being placed in the sumach-tan, are subjected to the action of a hydrostatic-press, which by a pressure of many tons forces out the extra-

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According to the mode in which the skin is adjusted on water, the skins are put into a kind side, may have this quable thickness given to it, with sumach liquor, and immersed in a tub of hot rollers; and the two portions may have various roundabout: this barrel has a door or opening in in equalities which may occur in the skin. One of the dressing, but by steeping the skin in a solution or section, the 'grain'side or the fleshleather. Instead of being sewn up into bags filled with bran and water, the skin is in a state to undergo that process which constitutes the principal in the original skin will be thrown into the other section. Either section, the 'grain'side or the 'flesh'side, may have this quable thickness given to it, according to the mode in which the skin is adjusted on the rollers; and the two portions may have various ratios given to their thicknesses, according to the position of the vibrating knife opposite the opening between the rollers. These machines, of which there are three or four in the Neckinger factory, were patented by the proprietors several years ago, and exhibit very beautiful mechanical arrangements. A sheep-skin of the usual size occupies about two minutes in splitting, during which time the knife makes from two to three thousand vibratory motions to and fro, cutting a minute portion of the skin at each movement. The preceding cut represents a sheep-skin undergoing the process of splitting in one of these machines.

As the thin 'skivers' are more readily acted on by the sumach tan than the thicker goat-skins, they are not sewn up into bags like the latter, but are immersed in the sumach-tub in an open state, and are tanned in a very short space of time. The subsequent operations require less delicacy than in the preparation of morocco leather, and do not call for much remark.

Among the varieties of leather tanned with sumach is the 'enameled' leather, made in several sections, for ladies' shoes. This is made of seal-skin or thin calf-skin, coated, after tanning, with a peculiar kind of varnish or japan capable of yielding a brilliant gloss.

3. Leather prepared with Alum.—The technical name of 'tawing' is frequently applied to the general process of splitting, or of separating a tanned skin into two thicknesses as it passes the knife, one-half passing over, and the other under the blade. A most ingenious contrivance is adopted for yielding to any inequalities which may occur in the skin. One of the rollers is made in several pieces, so adjusted that in passing over any thickened portions of the skin the common aperture between the rollers is widened at that part. It is one of the consequences of the construction of the machine, that one of the semi-thicknesses or sections must be equal and level in every part, while any inequalities which might have existed in the original skin will be thrown into the other section. Either section, the 'grain' side or the 'flesh' side, may have this equal thickness given to it, according to the mode in which the skin is adjusted on the rollers; and the two portions may have various

[Leather-splitting Machine.]
one part of its curved surface, through which the skins are placed; and when the water and ingredients are added, the door is closed, and the barrel made to rotate rapidly. The effect of the rotation is to cause the impregnated liquor to act intimately on every part of the skin. The substances placed in the barrel to act on this skin are, for the commoner kinds of leather, alum and salt; and for the better kinds, alum, salt, flour, and yolk of eggs: these latter ingredients are for the most part absorbed into the substance of the finer kid leathers, and seem to have the effect of imparting that beautiful softness and plumpness which such leather presents. About twelve pounds of alum and a little more of common salt are sufficient for about two hundred skins. Sometimes the skins are not put into the 'roundabout,' but are merely steeped in the solution in an open tub: whether the one or the other plan be adopted, however, a period of five minutes is sufficient to produce the effect. In that part of the 'tawing' process wherein eggs are employed, the eggs are broken, in the proportion of one to each skin, and the yolks only are mixed with water and a little meal in a tub: the skins are then introduced, and are trampled by the naked feet of a man until the egg has been thoroughly impregnated. The eggs employed in this process are imported from France; sixty or seventy thousand are purchased for the Neckinger factory every spring, and are preserved in lime-water till wanted, a mode by which they may be kept perfectly sweet for two years.

The tawed skins, after being hung up in a loft to dry, are stretched out, smoothed, and softened, by the process of 'staking,' represented in the annexed cut.

In one of the upper rooms of the establishment are a number of wooden blocks, having at the upper end a steel instrument, shaped somewhat like a cheese-cutter, but not having a very sharp edge. Over the semi-circular edge of this instrument each skin is drawn very forcibly, the workman holding it in both hands, and scraping the surface in various directions on the steel edge. This has the effect of stretching out the skin to its full extent, and of removing all the rigidity and stiffness which it had acquired in the previous processes. This is, indeed, one of the many processes of violent rubbing, scraping, or friction to which every kind of leather is subjected in the process of manufacture; but in this instance the rubbing is effected when the leather is nearly in a dry state.

For the production of 'imitation' kid leathers the skin of lambs is employed; and for this purpose lamb-skins are imported from the shores of the Mediterranean. They are imported with the wool yet on them, and as this wool is valuable, the leather-manufacturer carefully removes this before the operations on the skin commence. The wool will be greatly injured by the contact of lime; and therefore a kind of natural fermentation is brought about as a means of loosening the wool from the pelt. At the Neckinger establishment, one of the buildings presents, on the ground-floor, a flight of stone steps leading down to a range of subterranean vaults, or rooms, into which the lamb-skins are introduced, in a wet state, after having been steeped in water, 'broken' on the flesh side, and drained. The temperature of these rooms is nearly the same all the year round, a result obtained by having them excluded as much as possible from the variations of external temperature; and the result is that the skins undergo a kind of putrefactive or fermenting process, by which the wool becomes loosened from the pelt. During this chemical change, ammonia is evolved in great abundance: the odour is strong and disagreeable; a lighted candle, if introduced, would be instantly extinguished, and injurious effects would be experienced by a person remaining long in one of the rooms. Each room is about ten feet square, and is provided with rails and steps; and all the rooms open into one common passage or vault, and are kept close except when the skins are inspected. It is a point of much nicety to determine when the fermentation has proceeded to such an extent as to loosen the wool from the pelt; for if it be allowed to proceed beyond that stage, the pelt itself would become injured.

When the fermentation is completed, generally in about five days, the skins are removed to a bean and there 'slimed,' that is, scraped on the flesh side to remove a slimy substance which exudes from the pores. The wool is then taken off, cleaned, and sold to the hatters for making the bodies of common hats. The stripped pelts are steeped in lime-water for about a week, to 'kill' the grease, and are next 'fleshed' on the beam. After being placed in a 'drench,' or solution of sour bran, for some days, to remove the lime and open the pores, the skins are alumed and subjected to nearly the same processes as the true kid-skins. These Mediterranean lamb-skins do not in general measure more than about twenty inches by twelve; and each one furnishes leather for two pairs of small gloves. These kinds of leather generally leave the leather-dresser in a whitestate; but undergo a process of dyeing, softening, 'striking,' &c., before being cut up into gloves.

There are a few other kinds of skins prepared by aluming, but the general routine of processes is pretty much the same as herein described.

4. Leather prepared with Oil. — The 'killing' of the animal quality of skins (if we may use such an expression), whereby the skins are converted into leather, seems to consist in forcing out from the pores some albuminous substance, and replacing it with a substance of another kind. Thus in tanning hides, the tannin penetrates into the substance of the skin and combines therewith; in sumaching, the larger portion of the sumach does the same thing; so do the alum, salt, egg, and meal in tawed leather; and lastly, so does the oil in the kind of leather now to be noticed.

That variety of leather called chamois, chammy, shammy, shammyo, or shamoy, which is the characteristic of oil-leathers generally, was originally a beautifully soft leather prepared from the skin of the chamois goat. A similar mode of manufacture is now adopted for sheep and other skins, but the name of chamois, modified in the spelling to a strange degree, is still applied to the leather produced. Mr. Aikin,
in one of his lectures before the Society of Arts, made the following statement in reference to shamoyed leather:—" Till a few years ago, there was an immense quantity of the skins of sheep, goats, and deer shamoyed in England. Breeches of this article, either white or dyed, were commonly worn by persons whose occupations or amusements led them to be much on horseback. They were worn by most of the cavalry of Europe; and the English shamoyed leather, being of extraordinary good quality, was employed in clothing not only our troops, but the cavalry of Prussia, Austria, and most of the other German states. In the campaigns in Spain during the last war, it was discovered by the British commander that the health of the horse-soldiers was seriously affected in wet weather by the leather that they wore, which, fitting close to the skin and being long in drying, chilled the men and rendered them liable to rheumatism and other diseases. Woollen cloth was accordingly substituted; and the example having been followed by Austria and Prussia, this change has occasioned a great decline in that branch of the English leather-trade."

The shamoy leather, whether of the superior kind just alluded to, or of that more humble description known as "wash-leather," is prepared nearly as follows:—The deer and sheep skins undergo the earlier stages of preparation nearly in the same manner as for other kinds of leather, such as washing, liming, beaming, &c. It must be remarked, however, that the inferior or thinner kinds are generally made of split skins, the more irregular of the two halves, generally the flesh side, being used for this purpose; the other half being alumed or tawed for "skiver leather.

In general, oil-leathers have the "grain" surface of the skin entirely removed before any oil is applied; as this removal not only affords a much softer surface, but greatly increases the extensibility of the leather, which still remains sufficiently strong and elastic for the purposes to which it is applied. This "frizing," or removal of the grain, is effected either by the edge of a round knife or a rubber of pumice-stone.

The lime and other obstructions to the porosity of the skin having been removed by steeping in sour bran and water, the skins are wrung or pressed as dry as possible, and are then ready for the reception of the oil. This is forced into the pores in a curious manner. In one of the buildings of Messrs. Bevington's establishment are two pairs of "fulling-stocks," such as are represented in the preceding cut, and somewhat resembling those used in the woollen manufacture. Each pair consists of two stocks, which may be likened to heavy wooden hammers; the head, covered with copper, being attached to a long beam or handle lying in an inclined position. Near the lower end of each of these fulling-stocks is a pivot, or axis. As the wheel revolves, by which each hammer is in turn lifted up and let fall again, through a space of about a foot. This they do in a kind of trough, so that any substances which may be placed in the bottom of the trough receive a blow from each stock every time it descends. The upper or handle end of each stock is so adjusted as to work on a pivot or axis.

Into the trough connected with these fulling-stocks the leather is placed; the stocks are set in action; and the leather is beaten alternately by one and the other until rendered as dry as possible. Cod-oil is then poured on the skins in the fulling-machine, and this is forcibly driven into the pores of the skins by another lengthened beating with the stocks. The trough is so formed in an arc or curve, that as the stock is beaten on the skins, the latter become turned gradually over and over, whereby every part of each is exposed to the operation. When the oil is beaten in, the skins are removed, shaken out flat, hung out in the air to dry, again put into the fulling-mill, supplied with fresh oil, and subjected to a renewed fulling with the stocks. Again and again is the process repeated; oil being added on the skins in quantity, and then beaten into the pores by means of the stocks. This occurs as many as eight or nine times, oil being added each time, and well beaten in, until two or three gallons of oil have been imbibed by one hundred skins.

When the oil is thus forced into the heart of the skins, they are placed in large tubs, where they undergo a kind of fermenting process, by which a more intimate action of the oil upon the fibres seems to be induced. These tubs are placed in one of the lower buildings near the fulling-stocks; and from them the skins, now converted into shamoy leather, are removed, to be immersed in a weak solution of potash. This latter process is intended to remove whatever excess of oil may have remained in the leather. After being hung up to dry in the open air, the leather is finished.

Thus have we endeavoured to give an outline of a manufacture which is supposed to rank fourth in the kingdom, being only excelled in importance by those of cotton, wool, and iron. The quantity of hides and skins converted into leather yearly in England is almost incredibly large; at Messrs. Bevington's establishment alone there are about two hundred and fifty thousand skins annually converted into leather by the aluming or tawing process, two hundred and twenty thousand by the sumach-tanning process, as well as a small number by the oil-dressing process. This circumstance marks the importance and extent of the leather-manufacture, respecting which Dr. Campbell, in his "Political State of Great Britain," makes the following striking remark:—"If we look abroad on the instruments of husbandry, on the implements used in most mechanic trades, on the structure of a multitude of engines and machines; or if we contemplate at home the necessary parts of our clothing—shoes, boots, and gloves—or the furniture of our houses, the books on our shelves, the harness of our horses, and even the substance of our carriages,—what do we see but instances of human industry exerted upon leather? What an aptitude has this material in a variety of circumstances for the relief of our necessities, and supplying conveniences in every state and stage of life? Without it, or even without it in the plenty we have it, to what difficulties should we be exposed!"
CULTIVATION OF MOUNTAINOUS
DISTRICTS.

The cut at the head of this notice will undeceive such
of our readers as are accustomed to associate the idea
of almost universal barrenness with a mountainous
country. Here they see the mountain slopes cultivated
with the utmost care to their very summit; and unless
such labours were repaid by the fruitfulness of the soil,
we may feel assured that they would soon be applied
in some other direction. It must be recollected that
the soil of many of the most fertile valleys consists for
the most part of accumulated material, washed down
from the mountains by the rains, after having pre-
viously become softened and decomposed by the action
of the elements. In many instances where the dis-
integration of rocks and mountains is constantly going
on, the matter is hurried down by torrents to the rivers
and carried out into the sea. By forming terraces on
the mountain sides the decomposed substance is stopped
in its descent and accumulates sufficiently to form a
series of long narrow gardens. In warm climates, if
water can be procured, these patches are enriched and
beautified by a luxurious vegetation, and the cultivators
are amply repaid for their ingenuity and industry.
The scarcity of good land or comparative security from
oppression may have led in the first instance to this
mode of cultivation. While the cultivator of the
plains, in countries subject to oppression of all kinds, is
constantly exposed to pillage, the mountaineer enjoys
a higher degree of security, which is at once evident
in the superior industry by which he renders the
barren rock fruitful.

In Syria the traveller is frequently delighted at the
manner in which cultivation creeps up the hills. The
country consists almost wholly of mountain ranges.
He rises from the valley to the hills only to descend
again into the valley, and is constantly rising and
descending in his passage through the country. He
sees villages perched on the mountain sides, which
Volney describes "as if ready to glide from the steep
declivities on which they are built, and so disposed that
the terraced roofs of one row of houses serve as a street
to the row above them." Occasionally the terraced
side of a mountain, with its mulberry-trees and vines,
becoming detached by a sudden thaw, does slide into
the valley below. On one of these occasions a law-
suit arose between the proprietor of the ground in the
valley and the owners of the land-slip; but the emir
caused both parties to be indemnified for their mutual
losses. Soil is so scarce in some parts of the country,
that the garden of a convent, situated in a very sterile
district, near Mount Horeb, is supplied with earth
brought all the way from Egypt on the backs of
camels. Here we may expect to find terraced cultura-
tion most assiduously practised, and under the Turkish
rule there are political reasons also which render the
heart of the mountains a better field for industry than
more accessible places. The seaward slopes of the
mountains are in general cultivable, while the eastern
slopes, towards the desert, are usually barren. The
inaccessible parts of the former are often covered with
firs, larches, oaks, box-trees, laurels, yews, myrtles,
and a variety of wild shrubs, and contain springs of
excellent water, the rills from which irrigate the cul-
tivated part of the slope. Here the mulberry, the
olive, the vine, the fig, and other plants useful to man
are planted, and every inch of ground is turned to
account.

The appearance of a country which is thus culti-
vated is extremely beautiful and interesting, and the
variety of plants which flourish on a small but
constantlly ascending surface, is much greater than
where it is spread out horizontally, as some thrive
only at a certain elevation, and could scarcely be pro-
duced in hot plains. Dr. Clarke was struck with the
highest admiration at the beautiful appearance of the
terrace cultivation, and the industry which had made
it so. He says—"The road was mountainous, rocky,
and full of loose stones; yet the cultivation was every-
where marvellous: it afforded one of the most striking scenes of human industry which it is possible to behold. The limestone rocks and stony valleys of Judaea were like in economy with those of the Lebanon and olive-trees; not a single spot seemed to be neglected. The hills, from their bases to their utmost summits, were ever spread with gardens; all of which were free from weeds, and in the highest state of cultivation. Even the sides of the most barren mountains had been rendered fertile by being divided into terraces, like steps, rising one above the other, upon which soil had been accumulated with astonishing labour. Among the standing crops we noticed millet, cotton, linseed, and tobacco; and occasionally small fields of barley. A sight of this territory can alone convey an idea of its surprising produce. It is truly the Eden of the East, rejoicing in the abundance of its wealth. Under a wise and beneficent government, the produce of the Holy Land would exceed all calculation.

There is also in Syria and many other mountainous countries a singular variation of climate in places adjacent to each other, and which is productive of corresponding differences in the vegetation of the country. Volney has placed this fact in an interesting point of view. It (he says) is owing to the different climates under the same sky, and collects within a narrow compass pleasures and productions which nature has elsewhere dispersed at great distances of time and places. With us, for instance, seasons are separated by months; there we may say they are only separated by hours. If in Saide or Tripoli we are incommoded by the heat of July, in six hours we are in the neighbouring mountains, in the temperature of March; or, on the other hand, if chilled by the frosts of December, at Besharri, a day's journey brings us back to the coast amid the flowers of May. The Arabian poets have therefore said that the Sannin (the highest summit of Lebanon) bears winter on his head, spring on his shoulders, and autumn in his bosom; while summer lies sleeping at his feet.

The mulberry-tree has latterly become so profitable as to constitute a most important source of wealth to the whole country of the Druzes, by the quantity of silk which it enables them to produce. The price of silk has doubled within the last twelve or fourteen years, during which the cultivation of the mulberry has extended itself to the exclusion of other trees, but even of garden produce. This, at least, is the case at Beirut, which derives its principal supply of garden vegetables from Sidon, whence they are brought by the peasants of the surrounding country.

SUFFERINGS OF THE PARTY COMPOSING CAPTAIN GREY'S EXPEDITION OF DISCOVERY IN WESTERN AUSTRALIA.

The history of colonization, and the progress of discovery in the great island or continent of Australia, are both subjects of great interest. The interior is still for the most part unknown; but sufficient to clear up former misconceptions. When the Blue Mountains behind Sydney were first passed, and the rivers were found to pursue a westerly course, it was concluded that the waters were not, as in ordinary cases, discharged into the ocean; but found their way into a vast lake in the interior, the land dipping inward towards such a lake. But when it was ascertained that the ocean flowed from the central parts towards the coast. This erroneous view has been dissipated by the researches of Captain Sturt and others within the last twenty years; and several others, equally incorrect, have been removed in consequence of the additions which have been made to our knowledge of the country. We have still much to learn in this quarter, and while the chance of new discoveries of any importance on the continent are very remote, there are indications to the aspirant after geographical honours in the Australian continent. The dangers and difficulties to be surmounted are of no ordinary kind, and not to be lightly thought of by the most daring; and no man of intelligence, however bold and enterprising, will think lightly of them. Among the recent names which have been added to those of the world, George Grey, Esq., late a captain in the army, and now governor of South Australia, is that of George Grey, Esq., late a captain in the army, and now governor of South Australia. He left the Swan River, in Western Australia, in February 17th, 1840, with a view to examine and survey the parts of the western coast between the parallel of 32° and that of 23° south, the object of the expedition being also the exploration of such parts of the coast as appeared to be worthy of particular notice. The party were conveyed to Shark's Bay in an American whaler, where they were to be left with three whaling-boats, and provisions for five months. One of the boats was soon swamped; and on the 20th of March, after having endured much suffering, they returned to the depot of their departure. Before the end of the first month, however, it was found that in consequence of the heavy gales the sea had washed over the island and destroyed the provisions, which had been buried in the sand in an apparently secure place. Two men belonging to the party, instantly abandoning all discipline, began seizing the scanty remain of the stores on the beach; but this outbreak was promptly repressed. The whole party were already in a very weak state; the boats were leaky; and Captain Grey determined to make for Swan River. On reaching Gantheaume Bay, in about 28 1/2° south latitude, both boats were wrecked in a tremendous surf. We propose accompanying Captain Grey and his party from this point to Perth.

The boats were wrecked on the 1st of April, and though, from the effect of previous hardships, Captain Grey doubted if the men retained sufficient strength for such a task, there was no resource left as a means of preserving their lives than that of walking to Perth, distant three hundred miles in a direct line; but which, of course, could not be reached without many deviations occasioned by hills and other obstacles. The party easily disposed of these, and Captain Grey, and Kaiser, a native; and on dividing their stock of provisions, each man received twenty pounds of sour flour, which only necessity could induce them to eat, and one pound of salt. On the 2nd of April the expedition started, the plan being to walk an hour, and then halt for ten minutes. In these intervals Captain Grey took notes and entered the bearings of the route in his journal, which he scrupulously kept from first to last. Many of the men had loaded themselves with various articles taken from the boats, in the hope of making something by selling them at Perth, and this burden seriously added to their difficulties, even in the first day's journey. A thin scrub was passed through, with great exertion. On the 3rd, after a scanty breakfast, the party set off at daylight, and, during the day, had to pass through an almost impenetrable scrub, which occupied two hours and a half, and left them in an exhausted state. Still the men encumbered with heavy bundles could not be induced to abandon them. The events of the 4th fully developed the difficulties of the expedition. Only twenty miles were performed during the whole day, and yet, though they were in a country well supplied with water, this was accomplished with the greatest difficulty. Captain Grey was harassed by the physical exertion of getting the
men to move by earnest remonstrance and entreaties, but they still persisted in carrying their useless burdens, and their conversation made it plain they would realize from them. A proposal was now made that they should rest a day or two, and then proceed; but Captain Grey foresaw that if they did not push on while they had some strength remaining, they would infallibly be lost; and most of the future difficulties of the journey are attributable to those who were deterred from taking on the plan of traveling five miles a day, with occasional halts for a day or two.

The enjoyment of present ease and rest was more powerful than the fear of future hardships; and Captain Grey had no other course but to submit to the majority.

5th.—This day and the previous one the party were moving on a tract of country so different in character from most parts of Australia, that it seemed as if they were on another continent, the points of difference in this district being "in its geological characters, in the elevation of its mountains, which lie close to the sea-coast, in the fertility of its soil, and the density of its native population." They encountered stunted trees, new growths, and their situation becoming critical, Captain Grey, intending to intimidate them by firing over their heads, pulled the trigger of his gun, which unfortunately did not go off, on which the natives redoubled their gestures of insult, imitating with derision the snapping of the gun which had missed fire. Captain Grey then fired the other barrel over their heads, but they were still scarcely dismayed, and he now fired his rifle at a heap of closely-matted dead bushes two or three yards to the right of their main body, and as the dry bushes cracked and flew in all directions, the natives at length took to their heels.

6th.—Most of the party had not more than seven or eight pounds of flour, which was in a state of fermentation, and one man compelled the party to stop for him every five minutes; and, on halting, the men could not be roused for three hours. They still carried their boots from the wreck. The dogged determination to proceed by short marches and long halts had already brought them to a point where the majority were forced to give up the idea of continuing the journey, and Captain Grey from this day abandoned the hope of getting the party safely into the settled districts.

7th.—They were gradually ascending an elevated range, the summit of which Captain Grey was the first to reach, the men with their useless property toiling after him. He states that he should have "hated the tyranny of any man who could have compelled them to carry such a weight." Being certain that the district they were now in was one of the finest in Australia, with a great number of streams, an elevated coast frontage, and a large extent of fertile land, diversified with rich valleys, gently swelling hills, and picturesque wooded peaks, he named it the Province of Victoria. A lofty chain of mountains, about twenty one thousand yards eastward, and named Charles Range. The party passed the night in as "fine an amphitheatre of verdant land as the eye of man has ever gazed upon." The view was bounded by the Victoria Range; and seaward, through a romantic glen, was seen the great Indian Ocean. One of the men, Stiles, was found to be missing, and though he had pushed on continually behind, some of his company had doubtless made for him by some of the exhausted party; but the night passed without his being found.

8th.—The search for Stiles was resumed, and this perverse man, whose conduct had endangered the safety of all the others, was at length discovered, and they proceeded on their journey, but made little or no progress. Some of the men sullenly laid down, being dissatisfied with Captain Grey's plan of moving slowly, and he was at length obliged to halt.

9th.—A man named Woods, a principal supporter of the eight or nine miles a-day system, caused great delay by insisting upon sitting down every half mile. Under these discouraging circumstances the party had to pass through a thick belt of trees, which they approached with great difficulty. Captain Grey wished the men to proceed about five miles, to a point where he expected water would be found, for which they were much distressed, but could not refuse them. In the course of the afternoon he got them to advance about a mile and a half, but farther they would not go, neither would they part with their bundles. Some seventy miles, and were still two hundred and thirty miles from Perth, direct distance. Some were entirely destitute of provisions, and none had more than six or seven pounds of flour left. Captain Grey's stock consisted of one pound and a half of flour and half a pound of arrow-root, and the native was dependent on him for food. The whole party were in a much weaker condition than at the time of their departure, and various other difficulties had to be met with, such as the want of water, the heat, and the want of provisions. The next three days were passed in traveling slowly, with frequent halts to recruit their strength.

In this critical situation, Captain Grey determined to push on for Perth with the strongest men and best walkers, promising to send provisions for the rest to a place forty-five miles north of Perth. The party consisted of himself, the native, and four other men, and six were left behind who pursued the favourite system of halting.

11th.—We now accompany Captain Grey's party. After a wearisome walk over small hills covered with prickly scrub, they came to a thickly-matted wood, which required the greatest exertion to induce the men to push through. In great distress for want of water, to him; and various other difficulties had to be met with, such as the want of water, the heat, and the want of provisions. The next three days were passed in traveling slowly, with frequent halts to recruit their strength. In this critical situation, Captain Grey determined to push on for Perth with the strongest men and best walkers, promising to send provisions for the rest to a place forty-five miles north of Perth. The party consisted of himself, the native, and four other men, and six were left behind who pursued the favourite system of halting.

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THE OLD AND YOUNG COURTIER.—No. VI.

The Paston Letters* afford us some curious information as to housekeeping in general, and also as to the domestic education of the daughters of genteel families, at a period earlier than that of the production of the ballad we are considering, but more accordant with the description there given than that of the time assigned by the song. From the reign of Henry VI. downward, the growth of commerce, the destruction of the aristocratic families by the civil wars, and the long peace enjoyed during the reigns of Henry VII. and Henry VIII., had most materially altered the character of domestic establishments. The "twenty old fellows in blue coats and badges" were fast disappearing before the accession of Elizabeth, and were chiefly employed at court, or on occasions of great ceremony only. At the earlier period, these retainers were kept as a means of political influence, and were too often the instruments of the grossest outrage and injustice, of which the work we have just mentioned contains several instances of a most violent character, and Shakspere has represented a similar state of society in his "Henry VI.," in the contest between the Duke of Gloucester's and Cardinal Beaufort's "old fellows."


Nor was, probably, the payment of their money-wages quite so easy or such a matter-of-course affair as we are told by the ballad-writer. The great Earl of Warwick has a letter in the Paston collection urgently soliciting a loan of 20l., pledging his knighthood for its repayment; and the burden of a great part of the epistles in the work is the want of ready money. The inconvenience of these "old fellows" had been long seriously felt, and many prohibitions had been enacted against them, even from the time of Richard II., downward. Exceptions were, however, allowed, and under this cloak they were continued, and even expected on state occasions, such as when waiting on the king in his progresses. On the visit of Edward IV. to Norfolk, Sir John Paston had to provide twenty liveried retainers, and the Duke of Norfolk two hundred; but in the reign of Henry VII., the Earl of Oxford having received that monarch with a numerous retinue, that severe and politic monarch inflicted the full amount of the legal fine upon him for his transgression.

These serving-men were, however, still kept up for state. Dr. Donne, who was born in 1573, and who wrote his satires during the latter part of the reign of Elizabeth, speaks in them of

"a velvet justice, with a long
Great train of blue-coats, twelve or fourteen strong"
And in the comedy of 'Wit without Money,' by Beaumont and Fletcher, about 1625, the opinions of Valentine, one of the characters, are thus described:

"No gentleman that has estate, to use it
In keeping house or followers, for those ways
He cries against, for eating sins, dull surfeits,
Grooming of serving-men, mastering of beggars,
Maintaining hospitals for kites and curs,
Grounding their fat faiths upon old country proverbs;
God bless the founders! These he would have vented
Into more mainy uses, wit, and carriage."

These opinions, though exaggerated, were doubtless held by many.

Under the old system "the care" of "good housekeeping" was a matter of no small importance. It was necessary to use a wise foresight, as even articles of the most common use were then only to be procured in London. Sugar, honey, figs, even pewter vessels and candlesticks, with many other articles, are mentioned in the 'Paston Letters' as not procurable in Norwich. When making provision for Lent, Margaret Paston writes to her husband, "As for herring. I have bought a horse-load for 4s. 6d.; I can get none else yet. To prepare young ladies for such a care, they were sent to the houses of friends of a superior rank, to learn the domestic economy of a large household. Sir John Heveningham wishes to place a niece with Margaret Paston, and he says, "I will content ye for her board, that ye be well pleased." The daughter of Agnes Paston was placed with Lady Pole, the dowager of the Duke of Suffolk, and upon her marriage she writes to her mother requesting her, "as to my Lady Pool, with whom I sojourned, that ye will be my tender and good mother, that she may be paid for all the costs done to me before my marriage." All ladies but those of the very highest rank seem to have occupied themselves in at least the active superintendence of all household operations, from the pickling of beeves and hogs for their daily consumption, to the preparation of distilled waters or ointments as medicaments for their own families or their neighbours.

The alteration in this state of manners, which had been gradually taking place, had no doubt produced a striking contrast by the time of James. The extension of printing had also elevated the standard of education and strictness which had marked that of the previous reign, or at least not an insidious reproach against the too coming grossness upon the toocoming grossness.

Endure again the country conversation,
To be the lady of six shires! The men
So near the primitive making, they retain
A sense of nothing but the earth: their brains
And barren heads standing as much in want
Of ploughing as their ground. To hear a fellow

Make himself merry, and his horse, with whistling
Sellinger's Round! To observe with what solemnity
They keep their wakes, and throw for pewter candlesticks!
How they become the morris, with whose bells
They ring all in to Whitman-ale, and sweet,
Through twenty scarfs and napkins, till the hobby-horse
Tires, and the maid Marian, dissolve'd to a jelly,
Be kept for spoon-meat!"

Here are the old simple sports, with which luxury and fashion had become dissatisfied. The husband of the lady, Sir Thomas Bornwell, remonstrates with her as to the objects for which she desires to exchange them, in the following affectionate, yet manly manner:

"My heart is honest,
And must take liberty to think you have
Obey'd no modest counsel, to effect
Nay, study ways of pride and costly ceremony;
Your change of gaudy furniture, and pictures
Of this Italian master, and that Dutchman;
Your mighty looking-glasses, like artillery,
Brought home on engines; the superfluous plate,
Antique and modern; varieties of tires;
Fournier-pound suppers for my lord, your kinsman,
Banquets for other lady aunt, and cousin;
And perfumes that exceed all: trains of servants
To stifle us at home, and shew abroad
More motley than the French or the Venetian,
About your coach, whose rude portmanteau
Must pester every narrow lane, till passengers
And tradesmen curse your choking up their stalls;
And common cries pursue your ladyship
For hindering of their market.

"Lady B. Have you done, sir?"
"Sir Thomas B. I could accuse the gaiety of your wardrobe,
And prodigal embroideries, under which
Rich satins, plushes, cloth of silver, dare
Not show their own complections; your jewels,
Able to burn out the spectator's eyes,
And show like bonfires on you by the tapers:
Something might here be spared, with safety of
Your birth and honour, since the truest wealth
Shines from the soul, and draws up just admirers,—
I could urge something more.

"Lady B. Pray do: I like
Your homily of thrift.
"Sir T. B. I could wish, madam,
You would not game so much.

"Lady B. A gamester, too!
"Sir T. B. But are not come to that acquaintance yet
Should teach you skill enough to raise your profit;
You look not through the subtility of cards,
And mysteries of dice, nor can you say
Charge with the box, buy petitionals and pearls,
And keep your family by the precious income;
Nor do I wish you should: my poorest servant
Shall not usurp my tables, nor his hire;
Purchase'd beneath my honour. You make play
Not a pastime, but a tyranny, and sex
Yourself and your estate by it.

"Lady B. Good! proceed.
"Sir T. B. Another game you have, which consumes more
Your fame than purse; your revels in the night,
Your meetings called the Ball, to which repair,
As to the court of pleasure, all your gallsants,
And ladies, tiller bound by a subpoena
Of Venus, and small Cupid's high displeasure.

My thoughts acquit you for dishonouring me
By any foul act; but the virtuous know
'Tis not enough to clear ourselves, but the
Suspicious of our shame."

In Massinger's 'City Madam,' of a somewhat earlier date, 1632, the two daughters of the wealthy knight Sir John Frugal contrast, even more distinctly the alteration alluded to in the ballad: the one repudiates the old duties, which she details, together with a well-founded reproach against the too common grossness with which their simplicity was too often accompanied:
my debts. Also I would have 6001. to buy me jewels, knight, Sir Denis of Morbecque, "by strength of his

when I ride a-hunting or a-hawking, or travel from one abode to another, I will have them attending; so for his brothers, behaved in a manner equally touchingeither of these said women I must ... ahorse. Also I will have six or eight less of his own danger, he cried out to him, according

and those things I would not, neither will be, his enemies, the King of France deposed himself like

gentlemen; and I will have my two coaches, one lined as he saw any blow about to be struck, "Father, guard

with yelvet to myself, with four very fine horses; and yourself on the right; guard yourself on the left," &c.

myself, besides my yearly allowance, I would have perished—as, to every cry for surrender from the

and for unfailing courage. And he would no doubt hare

's to say, we presume, in other words, acted according to their advice or counsel,

also contains a curious allusion to the customs of the theatre:

as the theatre:

So for his brothers, behaved in an manner equally touching either of these said women I must ... ahorse. Also I will have six or eight less of his own danger, he cried out to him, according
The battle began in the morning and ended at noon, and in that short space of time there was slain "all the flower of France; and there was taken, with the king and the Lord Philip his son, a seventeen earls, besides barons, knights, and squires." Indeed, "when every man was come from the chase, they had twice as many prisoners as they were in number in all; then it was counselled among them because of the great charge and doubt to keep so many, that they should put many of them to ransom incontinent (immediately) in the field, and so they did; and the prisoners found the English and Gascons right courteous. There were many that day put to ransom and let go, all only on their promise of faith and truth to return again, between Christmas and Easter, to Bordeaux with their ransoms. Then that night they lay in the field, beside whereas the battle had been: some unarmed them, but not all; and unarmed all their prisoners, and every man made good cheer to his prisoner; for that day whosoever took any prisoner he was clear his, and might quit or ransom him at his pleasure. All so went that night as there followed Lord Audley back to h'ent, and taking of the king. When the two aforesaid lords witnessed what immediately occurred there. Having

The earl of Warwick and Sir Reginald Cobham, 'Sirs, was this message infused new strength into the brave but we think verily he is either dead or taken, for he have taken him;' so they stray which should have bischiff followers, when we see suche evidences of his hii in. Then the French king, to eschew that peril, said, magnificently generous disposition, and the manner in which such gifts were bestowed; nor to find how such feelings spread downwards through the large body of knights and squires which in the middle ages formed a litter before the prince, who took him in his arms, and kissed him, and made him "great cheer." "Sir James," said he, "I and all ours take you in this journey for the best doer in arms: and to the intent to furnish you the better to pursue the wars, I retain you for ever to be my knight, with five hundred marks of yearly revenue, the which you shall bring him and his son in peace and rest to the for a romance, we conclude these episodes of the great field of Poitiers. "Also it fortunate that another
squire of Picardy, called John de Helenes, was fled from the battle, and met with his page, who delivered him a new fresh horse, whereon he rode away alone. The same season there was in the field the Lord Berkley of England, a young lusty knight, who the same day had raised his banner, and he all along pursued the said John of Helenes; and when he had followed the space of a league, the said John turned again, and laid his sword in the rest instead of a spear, and came running toward the Lord Berkley, who lifted up his sword to have stricken the square, but when he saw the stroke come, he turned from it, so that the Englishman lost his stroke, and John struck him as he passed on them, so that the Lord Berkley's sword fell into the field; when he saw his sword down, he lighted suddenly off his horse, and came to the place where his sword lay; and as he stooped down to take up his sword, the French square did prick his sword at him, and by hap struck him through both the thighs, so that the knight fell to the earth and could not help himself; and John alighted off his horse and took the knight's sword that lay on the ground, and came to him, and demanded if he would yield him or not: the knight then demanded his name. 'Sir,' said he, 'I fight John of Helenes, but what is your name?' 'Certainly,' said the knight, 'my name is Thomas, and I am Lord of Berkley, and I am on the Marches of Wales.' 'Well, Sir,' quoth the square, 'then ye shall be my prisoner, and I shall bring you in safeguard, and I shall see that you shall be healed of your hurt.' 'Well,' said the knight, 'I am content to be your prisoner, for ye have by law of arms won me.' There he sware to be his prisoner, rescue or no rescue, and with the square that shot him went out of the knight's thighs, and the wound was open; then he wrapped and bound the wound, and set him on his horse, and so brought him fair and easily to Châtel-Herault, and there tarried more than fifteen days for his sake, and did get him remedy for his hurt; and when he was somewhat amended, then he got him a litter, and so brought him at his ease to his house in Picardy: there he was more than a year, till he was perfectly whole. And when he departed he paid for his ransom six thousand nobles, and so this square was made a knight by reason of the profit that he had of the Lord Berkley.

The supper that night on the field will, no doubt, live in memory of most readers. Certainly never did chivalry show itself more vividly in the contrasted light which it so loved—of its terrible power and recklessness in the field, and its almost feminine grace and gentleness out of it—than at Poitiers. We have seen what the battle was: here is Froissart's notice of the supper. The prince made the king and his son, the Lord James of Bourbon, the Lord John d'Artois, the Earl of Tancarville, the Earl d'Estampes, the pure Earl of Greville, and the Lord of Pertney, to sit at one board, and other lords, knights, and squires at other tables; and always the prince served before the king, as humbly as he could, and would not sit at the king's board, for any desire that the king could make: but he said he was not sufficient to sit at the table with so great a prince as the king was: but then he said to the king, 'Sir, for God's sake make none evil nor heavy cheer, though God did not this day consent to follow your will: for, sir, surely the king my father shall bear you as much honour and amity as he may do, and shall accept you so readily, that ye shall blame your friends together after: and, sir, I pray you to rejoice, though the journey be not as you would have had it; for this day ye have won the high renown of prowess, and have past this day in valiantness all other of your party. Sir, I say not this to mock you: for all that be on our party, that saw every man's deeds, are plainly accorded by true sentence to give you the palm and chaplet.'

The fate of the war was decided by this victory: the French were utterly dispirited, and the country was in a fearful state of distress and disorganization, which grew daily worse. John remained for two or three years prisoner in London; and then the peace of Bretigny was concluded, by which Edward received the country by a series of petty but continual successes. The prince himself was allowed to go over to France to make the necessary arrangements, which failing to agree with his royal master, he returned, and the King of France was then the country.

The Constitution of the Atmosphere adjusted to Animal and Vegetable Life. The air we breathe, and from which plants also derive a portion of their nourishment, consists of a mixture of oxygen and nitrogen gases, with a minute quantity of carbonic acid, and a variable proportion of watery vapour. The air contains about 78 parts of nitrogen, 21 parts of oxygen, and 1 part of carbonic acid. The carbonic acid amounts only to a small portion in the atmosphere; but its presence is very necessary to the respiration of animals, and to the support of combustion (burning of bodies). The oxygen serves principally to dilute the strength, so to speak, of the pure oxygen, in which gas, if unmixed, animals would live and combustibles burn with too great rapidity. The small quantity of carbonic acid affords an important part of their food plants, and the watery vapour in the air aids in keeping the surfaces of animals and plants in a moist and pliant state; while, in due season, it descends also in refreshing showers, or satisfies the evening leaf with sparkling dew. There is a beautiful adjustment in the constitution of the atmosphere to the nature and necessities of living beings; and every change of the pure oxygen is tempered, yet not too much weakened, by the admixture of nitrogen. The carbonic acid, which alone is noxious to life, is mixed in so minute a proportion as to be harmless to animals, while it is still beneficial to plants; and when the air is overloaded with watery vapour, it is provided that it shall descend in rain. These rains at the same time serve another purpose. From the surface of the earth there are continually ascending vapours and exhalations of a more or less noxious kind; these the rains wash off from the air, and bring back to the soil, either by fertilizing the atmosphere through which they descend, and refreshing and fertilizing the land on which they fall.
STEAM COMMUNICATION WITH INDIA.

When two places become connected by a railway, the change effected in their means of communication is striking in proportion to their distance from each other. London Bridge and Greenwich are some twenty minutes nearer to one another than they were before a railway linked them more closely; but the journey from London to Lancaster or Darlington is shortened by fourteen or fifteen hours, even on a comparison with the quick travelling of the mail-coaches, which were superseded by the railways when everything connected with them was carried to the utmost perfection. The improvements effected within the last seven years in the means of communication between England and India are far more extraordinary than any of the changes wrought by the railways in this country. Sixty years ago the voyage from London to Calcutta usually occupied five and six months, and to China seven months, and the "course of post" with India was calculated at little less than twelve months. Intelligence from this distant quarter arrived only at uncertain intervals, and often through indirect channels. A Dutch or Danish East Indianman left despatches for England at Lisbon, or Falmouth, or wherever it was most convenient to touch. The French received despatches from their establishments in India; and reports, originating in France, were often in circulation in London, which neither the East India Company, the government, nor any one could affirm or contradict, though they might relate to matters of the highest import and which called immediately for active measures. Occasionally despatches were received overland both in England and France, and by the Asiatic Company at Trieste; but these opportunities of communication were only available to the parties who received them, and led to vague rumours, or such reports as it happened to be for the interest of each to put into circulation. Overland despatches reached London in rather more than three months through Persia and Turkey, via Constantinople. Thirty or forty years ago, by improvements in nautical science, the voyage between England and India was reduced to about four months and a half; and within the last ten or fifteen years, further improvements of this nature, and a more accurate knowledge of the currents and winds experienced in the course traversed, reduced the average duration of the voyage to about three months and a half. A few voyages have been made in three months; but, taking the average, the saving effected was at least two months, the total saving in the "course of post" being nearly five months. Within the last half-dozen years the means of communication with India have been still further quickened, as we shall presently show.

Until 1836 the intercourse between Europe and India was carried on by the Cape of Good Hope. The distance of Calcutta from London by this route is above sixteen thousand miles; and it is something like going from London to Herne Bay by Tunbridge, Dover and Ramsgate, the distance to India by the Red Sea being one-half shorter. This advantageous line of communication was not opened until after several years' active exertions both in England and India. In 1830 the Hugh Lindsay, a steamer of four hundred tons, with two engines each of eighty horse-power, made the first experimental voyage from Bombay to Suez at the expense of the Indian government. Depôts of coal were previously formed at Aden, Judda, Cosser, and Suez. The steamer left Bombay on the 20th of March, and arrived at Suez on the 22nd of April. The mail consisted of three hundred and six letters, which might have reached England in sixty-one days from Bombay, if any arrangements had been made for forwarding them. The second voyage from Bombay to Suez was completed between the 5th and 27th of December in the same year. The third voyage was made in January, 1832, and though very unfavourable weather was experienced, the passage was completed in twenty-nine days and sixteen hours, the time actually occupied in steaming being twenty-one days and six hours. Seven hundred letters were in the mail-bags, and, but for the reason above mentioned, they could have been received in England in fifty-eight days. The Hugh Lindsay made a fourth experimental voyage in January, 1833, which was completed in thirty-three days, allowing above ten days for stoppages. In July, 1834, a select committee of the House of Commons on the subject of steam-navigation with India recommended the line by the
Red Sea, and a grant of twenty thousand pounds for the survey of the Euphrates; but this river was found to be impracticable, and the route by the Red Sea alone fixed the public attention. By this time its practicability for steam-navigation had been ascertained during the north-east monsoons, but not in those from the south-west. The latter, however, only prevailed four months in the year, from June to September inclusive. Only a quarterly communication was thought of at this period, either by Lord William Bentinck, then Governor-General of India, or Mr. Waghorn, whose services in improving the means of intercourse with India can scarcely be too highly praised.

In 1835 the line of communication by the Post-office steamers in the Mediterranean was extended to Alexandria, and this encouraged the exertions making in India to establish a regular communication by steamers between Bombay and Suez. Letters could now be transmitted from London to Alexandria, to the care of the British Consul, who despatched them to Alexandria himself, or had them conveyed by his agent, though they were often delayed several months. Only one-half of the line to India was then opened. Mr. Waghorn proceeded to Egypt about this time, to remedy the defect in the transmission of Indian letters to and from Alexandria. He appointed an agency in London, where letters intended to be confided to the Post-office were registered, and sent in a mail before being put into the Post-office. On the mails reaching Alexandria, these letters were forwarded immediately to Suez, and if no vessels were on the point of sailing, they were sent onward by janissaries or by the country boats to Mocha or Aden, where the opportunities of transmitting them to India were much more frequent. The letters sent through Mr. Waghorn's agency, laid quietly at the British Consul's until they could be despatched direct from Suez. At this period, there was, strictly speaking, no regular conveyance between England and India. Ship-letter bags were made up at the Post-office in the same way as they now are for the Australian colonies, but no one on putting a letter into the Post-office of a country town knew when it would leave England, and those who had frequent occasion to write to friends in India often found it advantageous to transmit their letters to some agent in London, who knew what ships were likely to make the quickest passage, or to stop at the fewest intermediate points; and could therefore arrange matters to the advantage of India. The mails left London about twenty-four hours before the public post-office remained there until another ship sailed. In 1836, the Hugh Lindsay again left Bombay for Suez, with letters and passengers, and in consequence of the arrangements of Mr. Waghorn, and the extension of the packet service to Alexandria, the mail reached England in fifty days; but it was hoped that by various improvements the time might at a future period be reduced to about forty days. More than a year elapsed before the line of steamers between Suez and Bombay was completely established; but in this interval Mr. Waghorn accelerated the rate of communication by conveying the Indian letters through France, instead of sending them to Famouth by the Mediterranean steamers, which stopped at Gibraltar and Lisbon. In 1839 the English Government concluded a convention with that of France, for the transmission of the India mails through Paris to Marseille.

The mails from India are now despatched from Bombay on the first day in every month, after the arrival of the steamer from Ceylon, and the inland post with the correspondence from Madras and Calcutta. About the 20th of the month the steamer lands the mails at Suez, and by the 22nd they are put on board the Mediterranean steamer at Alexandria, which reaches Malta on the 24th, and Marseille on the 30th. Its arrival is announced in Paris by telegraph on the same day, a distance of nearly five hundred miles, and the most important items of news are communicated by the same means. Early in the afternoon the intelligence is published by the ministerial evening journal, a copy of which is forwarded by an extraordinary express to London, where the news is re-published about twenty-four hours afterwards. It is however sometimes the practice of the French government not to announce the telegraphic news until the day after it is received, or later; but occasionally the arrival of the mail at Marseille, and the intelligence which it brings, is officially made known at an official placard at the Bourse. The exertions of the London newspapers do not end with the despatch of the express from Paris, which perhaps may just simply announce the arrival of the mail. As soon as possible special couriers (for on several occasions more than one has been despatched) start for London with packets for the principal morning papers. Those of the Courrier et Journal are published in London. The opening of the South-Eastern Railway will frequently have the effect of bringing the publication of this information within the usual hours of business at the great marts for East India and China produce. Railroads through France have already produced frequent despatches to and from India, China, and the East generally. The Post-office authorities in France have on several occasions interfered most vexatiously with the couriers conveying these despatches for the London journals, and they have several times been seized, on the pretense that they were not authorised to carry letters. In March last, one of these couriers was prosecuted by a Post-office and sentenced to pay certain fines. It was frivolously contended that they might convey the despatches in post-chaises, but not on horseback. The London journalists represented their case to the French Minister, through our ambassador at Paris, but it does not appear that they have obtained any security against future interruptions. On the day following the arrival of the new newspaper the letters and newspapers are received at the Post-office. A week elapses, and the letters arrive which pay a lower rate of postage, and are not sent through France, but brought to Famouth by the Mediterranean steamer.

CARDINAL WOLSEY AFTER HIS FALL.

【MEMOIRS ON ENGLISH HISTORY.】

AMONGST the earliest, and certainly far exceeding most memoirs in interest and importance, is 'The Life of Wolsey, by George Cavendish, his Gentleman Usher.' It was long a question who wrote this remarkable book; but the doubt was satisfactorily cleared up by Mr. Hunter, who found that it was written by the brother of Sir William Cavendish, a faithful follower of the great Cardinal. There are ten MSS. in existence of this ancient work; but it has been very carefully edited by Mr. Singer. We confine our extracts to those more striking which relate to the great Cardinal after his fall from power.

The courtiers of Henry VIII. had procured the Cardinal's dismissal to the archbishopric of York. Wolsey commenced his journey in the beginning of
the Passion Week of the year 1530. He travelled on
his road with his attendants, performing the offices of
the Passion Week at Peterborough, and at other places
along the way. He halted at length at Southwell, near
Newark, where there was a palace belonging to his
archbishopric. "He was fain, for lack of reparation of
the bishop's place which appertained to the see of
York, to be lodged in a prebendary's house against
the said place, and there kept house until Whitesunday
next, against which time he removed into the place,
newly amended and repaired, and there continued the
most part of the summer, surely not without great
resort of the most worshipful gentlemen of the
country, and divers other, of whom they were most
gladly entertained, and had of him the best cheer he
could devise for them, whose gentle and familiar
behaviour with them caused him to be greatly beloved
and esteemed through the whole country. He kept a
noble house, and plenty of both meat and drink for all
comers, both for rich and poor, and much alms given
at his gates. He used much charity and pity among
his poor tenants and other; although the fame thereof
was no pleasant sound in the ears of his enemies, and
of many that were not disposed to have discretion in
people will report as they find cause; for he was much
more familiar among all persons than he was accused,
and most gladdest when he had an occasion to do
them good. He made many agreements and con-
cords between gentleman and gentleman, and between
some gentlemen and their wives that had been long
absent themselves from him, which would travel untosome parish church thereabout, which should rather
be taken for a laughing disport and therewould say his divine service, and either
horses, besides his mule for his own person, to be
made ready by the break of day for him and such
persons as he appointed to ride with him, and to ride
called Welbeck, where he intended to lodge by the
way to Scrooby, willing me to be also in readiness to
ride with him, and to call him so early that he might
be on horseback, after he had heard mass, by the
breaking of the day. Sir, what will you more? All
things being accomplished according to his command-
ment, and the same finished and done, he took a small
number before appointed, mounted upon his mule,
setting forth by the breaking of the day towards Wel-
beck, which is about sixteen miles from thence;
whither my lord and we came before six of the clock
in the morning, and so went straight to his bed, leaving
all the gentlemen strangers in their beds at Southwell,
nothing privy of my lord's secret departure, who
expected his uprising until it was eight of the clock.
But after it was known to them and to all the rest
there remaining behind him, then every man went to
horseback, galloping after, supposing to overtake him.
But he was at his rest in Welbeck or ever they rose
out of their beds in Southwell, and so their chief hunt-
ger considered it as a most pleasant business, and
was so glad to have such a master, having
and his estate, not out of Southwell, but at Welbeck,
and the very best and next way for me lords
sparking for any costs, where he might make a peace and
amity, which purchased him much love and friendship
in the country." After remaining for some time at
Southwell, the Cardinal removed to Scrooby, another
house belonging to the bishop, to the great pleasure
and delight of many, and to the great trouble and
disappointment of some of such as bare him no good will, howbeit the common
interests between other persons; making great assem-
blies for the same purpose, and feasting of them, not
sparring for any costs, where he might make a peace and
amity, which purchased him much love and friendship
in the country. Against the day of his removing, divers knights and other
gentlemen of worship in the country came to him to Southwell, intending to accompany and attend upon him in that
journey the next day, and to conduct him thither
forth to Scrooby. But he being of their purpose advertised, how they did intend to have lodged a great
stag or twain for him by the way, purposely to show
him all the pleasure and disport they could devise,
and having, as I said, thereof intelligence, was very
loath to receive any such honour and disport at their
hands, not knowing how the king would take it; and
being well assured that the people would require
much to understand that he would take upon him
such presumption, whereby they might find an occasion
to inform the king how sumptuous and pleasant he was, notwithstanding his adversity and overthrow, and
so to bring the king into a wrong opinion of him, and
cause small hope of reconcilement, but rather that he
should see he could not enter that park he called the
earl's, called Worksop Park, the which was within a mile
of Welbeck, and the very best and next way for my lord
to travel through on his journey, where much plenty
of game was laid in a readiness to show him pleasure.
Howbeit he thanked my lord their master for his
gentleness, and them for their pains; saying that he
should not be so much pleased with such pastimes, but
otherwise disposed; such pastimes and pleasures were
meet for such noblemen as delight therein. Never-
theless he could do no less than to account my Lord of
Shrewsbury to be much his friend, in whom he found
such gentleness and nobleness in his honourable offer,
to whom he rendered his lowly thanks. But in no
such pleasures or pastimes, but only to attend to
a greater care that he had in hand, which was his duty,
study, and pleasure. And with such reasons and per-
suasions he pacified them for that time. Howbeit he
yet as he rode through the park, both my Lord of Shrews-
bury's servants, and also the foresaid gentlemen,
moved him once again, before whom the deer lay
very fair for all pleasant hunting and coursing. But it
would not be; but he made as much speed to ride
through the park as he could. And at the issue out
of the park he called all his earl's gentlemen and the
keepers unto him, desiring them to have him comm-
ded to my lord their master, thanking him for his
most honourable offer and good will, trusting shortly
to visit him at his own house; and gave the keepers
forty shillings for their pains and diligence, who con-
ducted him through the park. And the next day he
continued until after Michaelmas, ministering many deeds of charity. Most
commonly every Sunday (if the weather did serve) he
would travel unto some parish church thereabout,
and there would say his divine service, and either
hear or say mass himself, causing some one of his
chaplains to preach unto the people. And that time,
he would dine in some honest house of that town,
The Structure of Plants, and the means by which their Nourishment is obtained.—A perfect plant consists of three several parts: a root which throws out arms and filaments in every direction into the trunk which branches out in a like manner, and leaves which, from the ends of the branches and twigs, send out more or less extended surface into the surrounding air. Each of these parts has a peculiar structure and a special function assigned to it. The stem of any of our common trees consists of three parts—the pith in the center, the wood surrounding the pith and the bark which covers the whole. The pith consists of bundles of minute hollow tubes, laid horizontally one over the other; the wood and inner bark, of long tubes bound together in a vertical position, so as to be capable of carrying liquids up and down between the roots and the leaves; and the outer bark of wood is sawn across, the ends of these tubes may be distinctly seen. The branch is only a prolongation of the stem, and has a similar structure. The root, immediately on leaving the trunk which branches out in a like manner, is also a similar structure, though its tubes are laid out away, the pith gradually disappearing, the bark also thinning out, the softest, till the white tendrils, of which its extremities are composed, consist only of a colourless spongy mass, full of pores, but in which no distinction of parts can be perceived. In this spongy mass the vessels or tubes which descend through the stem and root lose themselves, and by them these spongy extremities are connected with the leaves. The leaf is an expansion of the twig. The fibres which are sent to branch out from the base over the inner surface of the leaf are prolongations of the vessels of the wood. The green of the leaf, though full of pores, especially on the under part, yet also consists of or contains a collection of tubes or vessels, which stretch along its surface, and communicate with those of the bark. Most of these vessels in the living plant are full of sap, and this sap is in almost continual motion. In spring and autumn the motion is more rapid, and in winter it is sometimes scarcely perceptible; yet the sap is supposed to be rarely quite stationary in any part of the tree. From the spongy part of the root, the sap ascends through vessels of the wood, till it is diffused over the inner surface of the leaf by the fibres which the wood contains. Hence, by the vessels in the green of the leaf, it is returned to the bark, and through the vessels of the inner bark it descends to the roots. Thus the plants understand why the roots send out fibres in every direction through the soil; it is in search of water and of liquid food, which the spongy fibres suck in and send forward with the sap to the upper parts of the tree. It is to aid these roots in procuring food that, in the art of culture, such substances are mixed with the soil where these roots are, as are supposed to be necessary, or at least favourable, to the growth of the plant. It is not so obvious that the leaves spread out their broad surfaces into the air for the same purpose precisely as that for which the roots diffuse their fibres through the soil. The only difference is, that while the roots suck in chiefly liquid, the leaves imbibe almost solely gaseous food. In the sunshine, the leaves are continually absorbing carbonic acid from the air and giving off oxygen gas. To say, they are performing a vital act, not unlike the function of the lungs of the animal; but it is a totally different act. The animal lungs are in a hollow structure, and absorb oxygen from the air. When night comes, this process ceases, and they begin to absorb oxygen and to give off carbonic acid. But this latter process does not go on so rapidly as the former, so that, on the whole, plants when growing gain a large portion of carbon from the air. The actual quantity, however, varies with the season, with the climate, and with the kind of tree. The proportion of the whole carbon contained by a plant, which has been derived from the air, is greatly modified also by the quality of the soil in which it grows and by the shape of the leaf. Liquid food which happens to be within reach of its roots. It has been ascertained, however, that in our climate, on an average, not less than from one-third to three-fourths of the entire quantity of carbon contained in the crops we reap from land of average fertility, is really obtained from the air.—Johnston's Elements of Agricultural Chemistry.
THE SANDWICH ISLANDS.

The Sandwich Islands, named in honour of the Earl of Sandwich, first lord of the Admiralty, were discovered by Cook in 1778, during his last voyage. Most of the islands of the Pacific lie in groups, and the Sandwich group consists of ten islands, eight of which are inhabited. Hawaii (Owhyee), the largest island, where Cook was killed, is of about the same extent as Middlesex and the counties of Kent, Surrey, and Sussex, joined together. Another of the islands is about the size of Hertfordshire; two others are not quite so large; and the remainder are considerably smaller. They are all probably of volcanic origin, and the surface is generally broken and mountainous. The interior of the islands is generally covered with forests, and the population is usually settled within three or four miles of the coast. The mean annual temperature is about 75°, the extremes being 61° and 88°. The climate is considered more agreeable than that of Otahéeite.

Cook estimated the population of all the islands at four hundred thousand, but this has always been considered too high, and Mr. Ellis, the missionary, does not think that they exceed one hundred and fifty thousand. A census taken in 1832 gave the total population of all the islands at 130,000, and another in 1836 at 168,000; but neither can be depended upon. For many years, however, the population had been decreasing; but, in consequence of improved habits and modes of life, the case is now reversed. The natives were described by Cook as "blest with a frank and cheerful disposition," and "equally free from the fickle levity which distinguishes the natives of Otahéeite, and the sedate cast observable among those of Tongataboo." They are, however, of the same race which is found in the islands extending north and south over 70° of latitude, from the Sandwich group to New Zealand, and over 60° and 70° east and west, from Tongataboo to Easter Island. No traditions worthy of belief record the migration of this people over so large a space, but their manners and customs prove them to be of Asiatic origin. The Sandwich Islanders are generally well made, strong and active, their skins of a fine brown, inclining to a copper colour, hair black and rather coarse, and eyes constantly in motion. They do not appear ever to have been cannibals, and when Cook visited them in his "floating islands," and taught them "to know how great the world was," to use their own expressions, they were in a more advanced state than the natives of most of the Polynesian Islands. They cultivated their provision-grounds with care; manufactured a kind of cloth from the bark of the paper-mulberry; wove very neat mats with the fibres of the flax-plant; and exhibited considerable taste in their ornaments and dresses. A collection of their weapons and tools, and specimens of their cloths and mats, may be seen at the British Museum. But their moral state was in no respect superior to that of other benighted people. They acknowledged two beings as supreme authors of good and evil, each of whom had interme-
The worship of their war-gods was the most conspicuous part of their superstition; and these deities were propitiated by the sacrifice of some of the prisoners taken in battle. Human sacrifices also occurred when other modes of propitiating the gods failed. The shark was an object of worship. Women were forbidden to eat certain kinds of food, or to enter the apartment in which the men took their meals; and yet they were not excluded from the rights of chieflyship.

The hog, dog, and rat were the only animals found on the islands at the period of their discovery, and were each used as food. The taro, pounded and formed into a paste; the sweet potato; several kinds of banians; the cocoa-nut and bread-fruit tree supplied them with vegetable diet. The sugar-cane furnished an agreeable staple, and fish, especially mullet, of very excellent flavour, were preserved for use in salt-water ponds. Since they were first visited by Europeans, the cow, horse, sheep, and goat have been added to their live stock, and all thrive well except sheep. The cattle which Vancouver left in 1792, were tabooed, or rendered sacred, for ten years, and became a part of his rule, though many of them died. There are now bred; and the list of native fruits and vegetables has been increased by the addition of oranges, lemons, citrons, grapes, apples, pears, papaw apples, pomegranates, figs, melons, water-melons, cucumbers, pumpkins, French beans, onions, and red pepper. The pine-apple does not come to perfection, but tolerable tables and fresh provisions. In 1817 all the others acknowledged his sovereignty, and were under the authority of chiefs or governors of his appointment. He made a formalcession of Hawaii to England in the presence of Vancouver, but this proceeding was never acknowledged by any act of authority on our part. At a subsequent period, fear that either of these countries would endeavour to establish themselves on one of the islands, he placed their independence under the protection of England. The Russians did erect a fort, but the act was disavowed at St. Petersburg. Tamehameha received from us a national flag, which has seven horizontal stripes, and the union-jack in the corner. He died in 1819, and was succeeded by his son, Rhio-Rhio. This young man, accompanied by his queen, and a suite of several persons, visited England, in order that the assurance of protection on the part of England against any foreign encroachment on the independence of the islands, might be renewed and strengthened, and generally to see all that was interesting in this country, in faithful obedience to their last wishes.

After the death of Cook the islands were seldom visited, and it was not until after Vancouver's voyage, in 1792, that the intercourse with them became more frequent. About this period also the Pacific Ocean began to be resorted to by ships engaged in the whale fishery, most of which touched at the islands for vegetables and fresh provisions. On the Spanish colonies in South America becoming independent, the Sandwich Islands rose into greater importance as a market and commercial position. They were in the highway of ships trading between the west coast of America and the East Indies and China; and equally so for those which come from the Atlantic states of the American Union round Cape Horn, from which they sail direct to the Sandwich Islands, whence the trade-wind carries them quickly to Canton; and this constant intercourse has led them to imbibe the ideas and adopt the habits of civilized life with a rapidity which is without a parallel.

In November, 1819, Rhio-Rhio, having conferred with the principal chiefs, and found them favourable to his views, ordered the moraiais, or sacred places, and the whole of the sacred land of the state. He broke through the broken which prohibited women eating certain kinds of food, or eating in the presence of men. At a great feast he sent to his wives those parts which it was unlawful to taste, and sat down with them in the presence of the people. An insurrection occasioned by these revolutions was repressed with the greatest difficulty. In 1820 missionaries arrived in the islands from the United States, and their number was subsequently increased by those from the London Missionary Society.*

The natives became most anxious for instruction; schools were established; in 1822 the first book in the native language was printed; and the office of some of the Roman Catholic priests from the islands after they had exercised their functions for several years. In July, 1839, Captain Labastide, then the Roman Catholic religion was exercised, the natives were prohibited attending the churches.
fourteen merchants, principally Americans, have established stores at Honolulu, where articles of European fineness of texture, not too easily acted on by dilute sandal-wood. The town contains about seventeen thousand inhabitants. The manufacture of glass and crockery, hats, shoes, naval stores, &c., which is carried on by the inhabitants, is selected, the process of forming wares, crockery, hats, shoes, naval stores, &c., is sufficiently indicated. The officers of the Blossom. Twelve or fourteen merchants, principally Americans, have established stores at Honolulu, where articles of European and American manufacture may be obtained, as well as the productions of China and other parts of the world. The manufacture of glass and crockery, hats, shoes, naval stores, &c., which are retailed to the natives for Spanish dollars or sandal-wood. The town contains about seven thousand inhabitants, and there are billiard-rooms and public-houses for the accommodation of the ships' crews who visit the harbour. A newspaper is published in the English language, and several periodicals have been published at different times; one of which, in the Hawaiian language, sometimes contains articles written by natives. The printing-press is also employed in supplying the islanders with school and other books in the native language. Since the commencement of the American Mission a hundred million pages of printing have been executed. The translation and publication of the Bible in the native language was completed early in 1839. According to the 'Report of the American Board of Missions for 1841,' the number of foreign missionaries employed on the islands was seventy-nine, including physicians, secular superintendents, two or three printers and bookbinders, and forty female assistant-missionaries. There were nineteen churches, and above eighteen thousand church members. The number of schools was about two hundred, attended by fourteen thousand pupils, of whom ten thousand are stated to be readers. There were seminaries and boarding-schools for the children of chiefs, and for the education of native Christian teachers and ministers. The native Christians of the Sandwich Islands have contributed as much as 8000 dollars in a single year in support of the means of education and religious instruction.

ON THE PREPARATION OF DIES FOR COINS AND MEDALS.

A slight inspection of a newly-coined piece of money or an honorary medal must convince every one that the mould or original pattern whence it is produced must be a work of extreme nicety and importance. The outlines of the device are so fine, the legends and inscriptions so distinct, the head or other figure so gently and gracefully brought into relief, the surface of the sunken portions so smooth and regular, that it is evident the coin or medal owes its main beauty to the workmanship of the die-sinker or engraver. A few words in explanation of the process of manufacturing these dies may not be uninteresting.

It is perhaps scarcely necessary to remind the reader that coins are not cast; they are not produced by pouring melted metal into a mould, as ornamental works in iron and brass are generally made; they are struck, that is, produced by forcibly driving circular pieces of cold metal into the engraved mould or die, and causing it to adhere to the surface of the die-sinker or engraver. A few words in explanation of the process of manufacturing these dies may not be uninteresting.

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Although the metals whereof coins and medals are generally made are by no means hard, yet it is necessary to have an extremely hard die for striking them, both to ensure the production of many copies from one die, and to bring out all the fine lines which contribute so much to the beauty of the device. The dies are, therefore, made of steel; but as the steel is annealed to a certain state of softness for facilitating the labours of the engraver, and afterwards hardened for working, it is of the highest importance to the engraver to produce the greatest accuracy in the work or general level of the coin. The dies are, therefore, made of steel; but as the steel is annealed to a certain state of softness for facilitating the labours of the engraver, and afterwards hardened for working, it is of the highest importance to the engraver to produce the greatest accuracy in the work or general level of the coin.
office imports, on those for national and honorary medals.

The matter in which these dies are engraved does not admit of being clearly described, and it may suffice, therefore, to say that the engraving itself is wrought by means of small fine harden ed steel tools. Every part which in the future coin is to appear raised is here depressed, such as the Queen's head, the Britannia, the letters, &c.; while those which are to appear depressed are here raised; the depressions in the die being equal in depth to the relief in the coin. In making the dies of bogedeltaubly held it is termed, in 'higher relief,' than in coins, and consequently has to be cut more deeply in the die. The engraver tests his progress by taking casts from the die, either in clay or by means of melted type-metal.

When the die is, after much tedious and delicate labour, brought to a finished intaglio state, it undergoes the process of hardening; as a preparative for the processes to which it is afterwards to be applied. This process is of great importance, for any defect in the mode of conducting it may ruin the labour of many weeks or even months. The hardening resembles the previous process of softening, so far as regards the application of a high heat; but in the latter instance the metal is cooled gradually in the charcoal, whereas the former is heated in a volume of air, and cooled in air. It is then hardened and strengthened, is cleaned and polished, may reckon the daily produce of each press at thirty blowsof a very powerful press to complete the device of the matrix.

Pieces of soft steel, being impressed by this punch, and afterwards turned, polished, &c., become practically as useful as the original matrix, and are then used in the going-press to produce the coins. In the Mint, the internal economy of which is arranged on the strictest principles (every official having his duties prescribed for him with the utmost exactitude), the two officers most closely connected with the preparation of the dies are the 'clerk of the irons' and the 'chief engraver'; and their duties are thus apportioned. The "clerk of the irons" is to superintend the die-press rooms; the purchasing and forging of the steel; the engraving, hardening, and turning of the dies; to keep a true account of all the blank dies, matrices, and punches belonging to the Mint; to receive from the master and comptroller, and to transmit to the engraver, all orders respecting the dies; to unlock and he present whenever the great die-press for multiplying the dies is used; to be responsible for the die-press not being used for improper purposes; and to see that no medal or coin be struck, but by a written order from the master or his deputy. The 'chief engraver' is to make or receive draughts and models for dies, as the master may direct; to engrave the dies from the designs and models; to oversee the production of dies and punches; and in all matters to consult with the clerk of the irons the dies for any particular coinage, and to see that they are in a fit working state; to make a monthly return of all faulty or worn-out dies to the clerk of the irons; and to see that, during the actual process of coinage, the dies are renewed from time to time, as soon as the impressions appear in the least defective. The dies are secured in different modes of conducting this process.

The hardened die undergoes one or two processes to render it more durable. It is in some cases immersed in water, which is then gradually raised to the boiling point; this action of water in cold water, it becomes hard, brittle, and fragile; but this alone would not suffice in the case of the die, the engraved face of which might be injured by such a process. This face is covered with oil, spread in a thin layer; and the die is then placed with its face downwards in a crucible, and completely surrounded by powdered charcoal. It is heated to a cherry-red, and in that state is taken out with proper tongs, and plunged into a cistern containing a large quantity of cold water; here it is moved rapidly about, so long as a bubbling and hissing noise is heard, and is then left in the water till quite cool. Mr. Mushet (Encyclop. Brit.) describes a somewhat different mode of conducting this process.

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"The number of pieces which may be struck by a single die of good steel properly hardened and duly tempered not unfrequently amounts at the Mint to between three and four hundred thousand, but the average consumption of dies is of course much greater, owing to the different qualities of steel, and to the casualities to which the dies are liable: thus, the upper and lower die are often violently struck together, owing to a fault in the 'layer-on,' or that part of the machinery which ought to put the blank into its place, but which now and then fails so to do. There are eight presses at the Mint, frequently at work for ten hours each day; and I consider that the average consumption of dies is much greater, owing to the different qualities of steel, and to the casualities to which the dies are liable: thus, the upper and lower die are often violently struck together, owing to a fault in the 'layer-on,' or that part of the machinery which ought to put the blank into its place, but which now and then fails so to do. There are eight presses at the Mint, frequently at work for ten hours each day; and I consider that the average consumption of dies is much greater, owing to the different qualities of steel, and to the casualities to which the dies are liable: thus, the upper and lower die are often violently struck together, owing to a fault in the 'layer-on,' or that part of the machinery which ought to put the blank into its place, but which now and then fails so to do.

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In the less frequent event of 'medals' being struck, the operations of the press are much more difficult and slow than in producing coins, owing to the generally high relief which medals present. It is stated by Mr. Brande, that in a medal executed by Mr. Wyon, for the Royal Naval College, there was a representation of the head of the king, in such bold relief, as to require thirty blows of a very powerful press to complete the impression; and that it was necessary, on account of the hardening produced, to anneal each medal after every third blow, so that they were placed in the furnace, or immersed in water, during the hardening. About five years ago, there was a notice of a new method invented by Mr. Pistrucci, whereby medals could be produced without the process of engraving the dies; but we are not aware how far it has been practically applied.

* Professor Brande, in the 'Journal of Science.'
CARDINAL WOLSEY AFTER HIS FALL.

After Wolsey had resided for some time at the palace at Cawood, he settled to be installed in the Cathedral Church, according to the custom of his predecessors. When he was told that at the ceremony of the installation it was usual for the archbishop to walk on cloth, from St. James's Chapel to the Minster, he made answer to the same in this wise: 'Although,' quoth he, 'that our predecessors went upon cloth right sumptuously, we do intend, God willing, to go aloft from thence without any such glory, in the vamps of our hosen. For I take God to be my very judge that I presume not to go thither for any triumph or vain glory, but only to fulfill the observance and rules of the Church, to which, as ye say, I am bound. And therefore I shall desire you all to hold you contented with my simplicity and also I command all my servants to go as humbly, without any other sumptuous apparel than they be constantly used, and that is comely and decent to wear.' Great preparations were made for the installation of the Cardinal, which never took place. He was arrested some days before that which was fixed for the ceremony. 'Or ever I wade any further in this matter, I do intend to declare unto you what chanced him before this his last trouble at Cawood, as a sign or token given by God what should follow of his end, or of trouble which did shortly ensue, the sequel whereof was of no man then present either premeditate or imagined. Therefore, as much as it is a notable thing to be considered, I will, (God willing,) declare it as truly as it chanced, according to my simple remembrance, at the which I myself was present. My lord sitting at dinner upon Allhallow-day, in Cawood Castle, having at his board's end divers of his most worthiest chaplains, sitting at dinner to keep him company for lack of strangers, ye shall understand, that my lord's great cross of silver accustomedly stood in the corner, at the table's end, leaning against the tappet or hanging of the chamber. And when the table's end was taken up, and a convenient time for them to arise, in arising from the table, one Doctor Augustine, physician, being a Venetian born, having a boisterous gown of black velvet upon him, as he would have come out at the table's end, his gown overthrew the cross that stood there in the corner, and the cross trailing down along the tappet, it chanced to fall upon Doctor Bonner's head, who stood among others by the tappet, making of curtsy to my lord, and with one of the points of the cross razed his head a little, that the blood ran down. The company standing there were greatly astonied with the chance. My lord sitting in his chair, looking upon them, perceiving the chance, demanded of me, being next him, what the matter meant of their sudden abashment; I showed him how the cross fell upon Doctor Bonner's head. 'Hath it,' quoth he, 'drawn any blood?' 'Yea, forsooth, my lord,' quoth I, 'as it seemeth me.' With that he cast down his head, looking very soberly upon me a good while without any word speaking; at the last, quoth he (shaking of his head), 'Malum omen;' and therewith said grace, and rose from the table, and went into his bed-chamber, there lamenting, making his prayers. Now mark the signification, how my lord expounded this matter unto me afterward at Pomfret Abbey. First, ye shall understand, that the cross,
which belonged to the dignity of York, he understood
to be himself; and Augustine, that overthrew the
cross, he understood to be he that should accuse him,
by means whereof he should be overthrown, The
Master Walshe in an arresting of Doctor Augustine,
falling upon Master Bonner’s head, who was master of
my lord’s faculties and spiritual jurisdictions, who was
damnified by the overthrowing of the cross by the
physician, and the drawing of blood, betokened death,
which shortly after came to pass; about the very same
time of the day of this mischance, Master Walshe took
him up, and showed me there what he had done, as if it
could not be judged. And thus my lord took it for a very sign or
token of that which after ensued, if the circumstance
be equally considered and noted, although no man
was there present at that time that had any knowledge
of Master Walshe’s coming down, or what should
follow. Wherefore, as it was supposed, that God
shaped me most sure knowledge of his later days
and end of his trouble than all men supposed: which
appeared right well by divers talk that he had with
me at divers times of his last end."

The narrative of Cavendish thus proceeds: “The time
drawing nigh of his stalling; sitting at dinner, upon
the Friday next before Monday on the which he
intended to be stalled at York, the Earl of Northumber-
land came to the castle; and the Earl of Walshe, who
being Sunday, my lord prepared himself to ride
when the earl trembled said, with a very faint and
soft voice, order withinthecastle, it drew fast tonight. There
my lord was marvellously astonied, standing both still
his barber, and two grooms of his chamber, and when
a long space without any movement was past, they
should trouble you; therefore I beseech you to content
yourself.” Well, quoth my lord, then will I not depart out
of this house, but I will see them, and take my leave of
them in this chamber. And his
passout to my lord; and then done, they came to him fell ill; and it is evident, from the cautions observed, the interest which is felt in England for all that that those about him suspected that he intended to poison. A vast monument of English power and worthy praises, for their diligent faithfulness and honest truth towards him, assuring them, that, what chance soever should happen unto him, he was a true man and a just to his sovereign lord. And thus letters in addition to the public despatches. "On an

STEWART COMMUNICATION WITH INDIA.

We have mentioned the number of letters transmitted by the Hugh Lindsay in 1836, and while that vessel was employed in making experimental voyages, in 1783, according to one of the daily newspapers of that date, an overland mail brought twenty private letters in addition to the public despatches from the several presidencies of India, and from Ceylon, was 300,000. With increased certainty, rapidity, and frequency of transmission, the number had risen to 616,796 in 1840, and to 940,070 in 1841. Mr. Rowland Hill could scarcely desire a better illustration of the Indian journalism and principles of Post-office philosophy; but in this instance the postage is high. The Hugh Lindsay in 1836 conveyed a few hundred newspapers, but the number sent from India to Europe last year is believed to have exceeded 80,000; above 250,000 were received there from Europe; and it is thought that the number both ways, in 1842, will exceed 400,000. In this enumeration each cover is counted as one, though it may contain several newspapers.

Availing ourselves of the certainty and regularity of communication, several of the principal newspapers of India publish a monthly summary for circulation in Europe, containing the news from all parts of the world, and especially the important events in the commerce and literature of the continent. There are such monthly newspapers at Calcutta, Madras, Bombay, and Ceylon, and altogether about five thousand are despatched to England by each steamer for Suez. They will be found extremely interesting to the English reader, and no news-room should be without one of these concise summaries of Indian intelligence. They will tend materially to strengthen the interest which is felt in England in that vast monument of English power and influence, which has grown gradually from the possession of a trading fort, to the dominion, more or less supreme, over a hundred and fifty millions of the human race, the administration of a system of finance which raises an annual revenue of 15,000,000L., and the maintenance of an army of two hundred thousand men. Besides the large number of London and other newspapers circulated in India, four of the principal Indian newspapers supply their readers gratuitously with a monthly newspaper, carefully prepared in London at a considerable expense. There is, besides, a monthly newspaper for India prepared in London, called the "India Mirror," which is unconnected with the journals of the other presidencies, and one is published in London for circulation in England, which gives a monthly summary of Indian news immediately after the arrival of the overland mail. Every one who has connections in the colonies which do not enjoy the means of regular and certain communication with the mother-country has experienced the pain and annoyance arising from this circumstance. Letters and newspapers occasionally arrive several weeks before others are received which were transmitted some time before. Under such a system, the strongest ties at length become weakened; while the colony and its interests remain comparatively unknown. A rapid intercourse, effected by a line of steamers, would bring them within the range of general observation; and they would assume the distinctness and

Not the Hardwick of Derbyshire, but of Nottinghamshire.
The mails for India are made up in London on the last day of the month, and on the 4th; the former being sent by the steamer from Falmouth, and the latter through France to Marseille, and onward to Malta, whence the Falmouth steamer conveys them to Alexandria. The arrival of the English mail at either of the three Presidencies is usually far before the middle of the month. The 'Bombay Times,' in its 'Monthly Summary' dated April 1st, has graphically described the scene which occurs at that place. At the extremity of one of the promontories of the island there is a lighthouse ninety feet high, and, with its elevated base, it has an altitude of one hundred and twenty feet. At a distance of many miles, the Mauritius, or the Mauritian, as it is also called, is an interesting land-mark; and from its summit vessels may be descried at a great distance. As soon as they appear in the horizon, and their number can be ascertained, it is announced by signals at the lighthouse, which are repeated from a number of signal-posts, one or more of which are visible from nearly every house in the island. When the time for the arrival of the Suez steamer approaches, the lighthouse and signal-posts are watched with the greatest anxiety. A steamer is seen from the lighthouse, and the flag denoting that class of vessel is instantly hoisted; but there are steamers from the Indus, the Persian Gulf, and Surat, and it is uncertain whether it is the steamer from Suez or one of these. The doubt cannot be solved for another hour; but if it be the one from Suez, an immense red flag, fifteen feet long, with three white crosses on it, is immediately hoisted. A couple of hours elapses, and the vessel is visible to every one; and now business is at a stand until she reaches the roadstead. Boats push off, and she is boarded by persons from the newspaper-offices, who own the copyright of the news from Suez. When the time for the arrival of the steamer from Suez is announced, copies are forwarded in separate packages through France, so that no delay may take place in their delivery at Bombay and the other Presidencies. Ten or a dozen native 'peons,' each under an 'havildar' or sergeant, are attached to each of the newspaper-offices. Their costume is novel, that of the 'havildar' being smarter than the rest. All carry an umbrella or Chinese 'chilly' as a protection against the rain or the heat. As soon as the papers are folded, these newsmen are seen hurrying with them in all directions. About forty 'peons' are employed by the Bombay Post-office, and shortly afterwards they are also equally on the alert. The letters are enclosed in from fifty to sixty boxes, about two feet long by one and a half wide. Some of them are good lined with tin, but those which are transmitted through France are of tin entirely, and fastened by a spring in such a way that they cannot be opened except by force. Blacksmiths are in attendance at the Post-office to effect this. The editor of the 'Bombay Times' suggests that they should be of copper or zinc, with patent locks, which might be frequently changed; as the tin boxes become rusted, and papers are frequently driven by the wind and torn. At Ceylon, Madras, and Calcutta, the arrival of the monthly mail from England excites the same degree of interest.

Bombay is the present central point of communication between India and Europe. The communication between London and Calcutta is effected in six weeks, instead of as many months; and with Bombay in twenty-one or twenty-two days less, and on one occasion (in August last) in thirty-one days and five hours. Powerful steamers will be established during the present year, by which the letters to Calcutta and Madras will be forwarded, instead of by dak across the peninsula. One of the North American steamers has just made the voyage from Halifax to Liverpool in ten days and three hours, so that it is actually possible to traverse a portion of the globe between 36° 38' west longitude and 57° east longitude in the space of six weeks, passing at the same time through Liverpool and London. The system of steam communication in the Eastern hemisphere would be complete if Singapore, Ceylon, and the island of Socotra, at the mouth of the Red Sea, were made grand points of rendezvous for steamers. Lines of steamers from Canton, the Eastern Archipelago, and the colonies of Australia would make the voyage to each of those points in about ten days; and those from Calcutta and Madras would for the same purpose be connected with Ceylon; and those from Bombay, the Cape, and the Mauritius would join the grand line at the island of Socotra. New Zealand might perhaps be more advantageously connected, via the Isthmus of Panama, with the line of steamers already established between England, the West Indies, and the ports on the Gulf of Mexico. Some time or other there is every probability that such a plan will be in active operation.

We have given in the present part of this article a view of Suez from the sea. The town derives its sole importance from its situation at the head of the westernmost gulf or arm in which the northern extremity of the Red Sea terminates. In the earliest period of European communication between India and Europe; and it is the port where a large concourse of pilgrims annually embark for Mecca. Suez is not of older date than the early part of the sixteenth century; but the importance of the situation as a place of transit has always caused the existence of a city in the neighbourhood. The population of Suez consists of about twelve hundred Mohammedans and a hundred and fifty Christians. The place is poorly built and destitute of fresh water, and there is no fertile land in the vicinity. A bazaar, or street of shops, is tolerably well supplied with goods from Cairo, and there are several khans, or inns built around large courts; but the houses are generally of mean appearance. A commodious hotel has been established by Mr. Waghorn for the passengers to and from England and India. The town is surrounded by a poor wall on three sides, and there is a harbour and a good quay on the seaward side. It is about seventy miles from Cairo, between which place and Suez there are seven station-houses erected at the expense of the government. The houses are rented by Messrs. Hill and Co. of the Pasha of Egypt. The journey is performed in two-wheeled vans, with a sort of tilt cover, carrying four persons each. An omnibus has been just started which carries
six persons in summer and eight in winter. A light sedan is also used, slung upon poles, and carried by two donkeys, one before and the other behind. Both horses and donkeys are used for the saddle; and camels and dromedaries are employed to transport the luggage. The number of passengers by each of the Bombay steamers varies from thirty to seventy each way.

HAMBURGH.

The Great Fire of London, the Burning of Moscow, or the Earthquake at Lisbon in 1750, are the only events in modern history which afford a fitting comparison to the recent conflagration at Hamburg. The most remarkable facts connected with the commercial history of this important city have already been given (No. 446); and the misfortune which has just befallen it is a favourable opportunity for noticing some other portions of its general history. In another number we shall give an account, from authentic sources, of the great fire which has deprived between a fourth and a fifth of the entire population of house and home, and rendered them for a time dependent on the sympathies of civilized men in every part of the world.

In the ninth century Charlemagne had pushed his conquests to the banks of the Elbe, and as the still pagan inhabitants did not submit very willingly to his sword, he selected a somewhat elevated spot about seventy-five miles from the German Ocean, on the north bank of the Elbe and east bank of the Alster, and laid the foundations of a town. This was Hamburg, which, by the twelfth century, had become a place of considerable trade, and would have been still more flourishing if the Elbe and the German Ocean had not been infested by robbers and pirates, who harassed the commerce on which its prosperity mainly depended. Hamburg has the merit of having freed the Elbe and neighbouring seas from these lawless vagabonds. At the very period when our king John was practising something very like piracy in the English Channel, the citizens of Hamburg were planning the means of freeing the seas from the robbers and pirates who obstructed the rising commerce of Europe. For this purpose, in 1233 they concluded an alliance with the inhabitants of Ditmarsch, at that time independent, and those of the land of Hadeln; and two years afterwards Lubeck joined in this confederacy, which carried its objects into effect by maintaining ships and soldiers to clear the coasts between the Elbe and the Trave, and the waters from Hamburg to the ocean. This was the origin of the Hanseatic League, which played so conspicuous a part in the commercial history of the middle ages. Brunswick joined the two other cities in 1247, and was constituted a staple, that is, certain commodities could only be bought and sold there. A commercial route was opened overland from Brunswick to Italy, which then enjoyed the trade to the Levant and India. Hamburg and Lubeck thus became the emporia for the produce of the East, of the south of Europe, and the manufactures of Italy and Germany, which were distributed in the various countries of the north of Europe in exchange for their raw produce. To carry on such a trade with advantage the Hansards established a large number of trading factories, and amongst others was one in London, which afterwards became known as the Steel-yard. It was situated between Thames-street and the river, a little
to the east of Dowgate. For a long period the Hansards were very numerous and enjoyed important commercial privileges. England was not then sufficiently wealthy to carry on the commerce of the country with native capital.

Until the fifteenth century the town was confined between the Elbe and the cast bank of the Alster, and the population increasing, especially from immigration of refugees from the Netherlands, the west bank of the latter river began to be built upon. This part is distinguished as the New Town. The repeated wars in Germany, to the close of the eighteenth century, had rather the effect of promoting the prosperity of Hamburg than otherwise. It still continued the chief seat of commerce in the north of Europe, and at the commencement of the present century might justly be regarded as one of the most flourishing and opulent cities on the Continent. Its misfortunes commenced with the occupation of Hanover by the French in 1803. They seized Cuxhaven, at the mouth of the Elbe, to prevent English ships coming up the river, and the French declined the communication by the Hanseatic town, which commerce was paralyzed, and that direct maritime intercourse with many countries, on which Hamburg depended for its prosperity, was completely interrupted. The French also laid the inhabitants under contribution. In 1806 Hamburg was occupied by a large French corps under Marshal Mortier, and commerce was paralyzed. It was a very wealthy town, which had been made for the preservation of English merchandise and colonial produce, in a former year, now proved unavailing, and all articles of this description were either confiscated or burnt. At the end of 1810 Hamburg was incorporated with the French empire as the capital of the department of the mouth of the Elbe. Its fate as a great centre of commerce appeared now to be sealed; but the very earliest opportunity of regaining independence was eagerly seized, and when the Russians appeared at the gates of Hamburg early in 1813, and the French evacuated the town, the old constitution was joyfully restored. Unfortunately the Russians were unable to maintain their position, and the French again entered, and, as might be expected under such circumstances, punished the inhabitants for the alacrity which they had shown in greeting the arrival of the Russian troops. The citizens were treated with a degree of severity which excited indignation as well as sympathy, and were called upon for a contribution of 2,000,000l. sterling. During the siege of the town, which subsequently took place, the population of the latter was reduced to about five thousand, of which fifty were put to the sword, one hundred and forty-five were imprisoned, and the rest driven out of the town in the depth of winter, and the French seized the treasure at the Bank, amounting to 700,000l., thus destroying for some time the source of future credit when happier times arrived. The town was not relieved until May, 1814, and on the 26th the constitution was once more restored. The indemnity council of sixty; and, 3. of twenty-four subdeacons, the latter river begantobe built upon. This part is InnerAlster, is another, farthernorth, formed by the Outer Alster, the banks of which are occupied by the handsome residences of many of the merchants. Six miles west of Hamburgh is another favourite spot, where the most opulent persons in the city have their country-houses. The Elbe admits vessels drawing fourteen feet water at all times, and those of eighteen feet at spring-tides. The old town contains many canals, which are supplied chiefly by the Elbe, but partly by the Alster, and are filled with water each tide. Almost all the warehouses are close to these canals. The streets, like most of the old towns of the Continent, are narrow and narrow, the general appearance of the place by no means corresponds to the idea which its commercial importance naturally excites. The houses are old-fashioned, and many of them are either built of wood entirely, or contain a large quantity of timber. At the same time they are not particularly picturesque, and, as observed in our former notice of Hamburgh, a far better description of buildings are very remarkable for their architecture or history. The streets in the 'new town' are broader and more regular; but the still newer town which will shortly arise will no doubt exhibit great improvements.

Until 1768 the kings of Denmark claimed the sovereignty of Hamburg as Counts of Holstein, and its rights as a state of the empire were recognised in 1618, though it did not obtain a seat or a vote in the diet. Hamburg frequently paid large sums to avert attacks from Denmark; but the conclusion of a treaty with the House of Holstein in 1704 put an end to its claims; and in 1770 it was confirmed in its rights as a free city of the empire. The archbishops of Bremen claimed the cathedral and the property belonging to it, but it was assigned to Sweden in 1648, and afterwards passed to Hanover with the duchy of Bremen. In 1802 the cathedral and its property were finally secured to Hamburg. On the 8th of June, 1813, Hamburg joined the Germanic confederation as a free Hanseatic city. The constitution consists of a senate, which acts under certain popular limitations. The senate, which is composed of four burgomasters and twenty-four senators, with four syndics and four secretaries, has the executive power, and the sole right of proposing laws; but no laws can be made and no taxes imposed without the consent of the citizens in common hall. The citizens are divided into five parishes, each of which elects four burgomasters, and members to the council of one hundred and eighty, consisting—1. of fifteen elders, who are the guardians of the laws, and have the affairs of the churches and the poor under them; 2. of forty-five deacons, nine from each parish, who with the elders form the council of sixty; and, 3. of twenty-four subdeacons in each parish, who are very influential in regard to the common hall, where at least two hundred citizens must be present. From this council is chosen the board of sixty, and out of that the fifteen elders or aldermen. Only the senators and the elders receive salaries. For the administration of justice there are various tribunals. In the last resort the decision is made by a High Court of Justice, consisting of the senate, sitting at Lübeck. In the German diet Hamburg has one vote in the deliberations, but in the select
council it has a vote only in common with Lübeck, Bremen, and Frankfort. Its contingent to the army of the Confederation is one thousand two hundred and ninety-eight men, and its contribution to the general fund five hundred florins per annum. It has also a burgher guard of nine thousand infantry, cavalry, and artillery. The territory of Hamburg comprises an area of about one hundred and fifty square miles (including the city), and contains a population of one hundred and forty thousand, the population of Hamburg and its suburbs being about one hundred and twenty thousand. Lutheranism is the religion of the state, but all denominations enjoy toleration, with the exception of the Jews, who labour under several restrictions from which others are exempt.

The intercourse of England with Hamburg is now on a different footing from that on which it so long existed during the middle ages; but it is not less intimate or advantageous than it was centuries ago. In 1837 one-third of the shipping which arrived at Hamburg was from the ports of this country, chiefly London and Hull. Their aggregate burden was one hundred and sixty thousand tons, the proportion for steam-boats being sixty-seven thousand five hundred tons. There is always a large quantity of British manufactured goods in the warehouses at Hamburg.

TO BE CONTINUED.

SUFFERINGS OF THE PARTY COMPOSING CAPTAIN GREY'S EXPEDITION OF DISCOVERY IN WESTERN AUSTRALIA.

13th.—At noon Captain Grey shared the damper with Kaiber, who had become weak and dispirited for want of food; and, had he been capable of searching for his food, the vegetable productions of the country were, with one or two exceptions, quite unknown to him. Captain Grey says: "It was almost a satisfaction to me when the damper was gone, for, tormented by the pangs of hunger as I had now been for many days, I found that nearly the whole of my time was passed in struggling with myself as to whether I should eat at once all the provisions I had left, or refrain till a future hour. Having completed this last morsel, I occupied myself for a little time with my journal, then went to sleep in a hole in the sand. On waking the next day, I felt myself as contented and cheerful as I had ever been in the most fortunate moments of my life." This day they walked thirty-one miles, and encamped without having met with water. Kaiber found some of the nuts of the Zama-tree, and as they were dry, they could be eaten with safety; but some of the men had eaten them before they were in this state, and were seized with vomiting and vertigo, which still further reduced their strength. After the fires were lighted for the night, the following little incident took place: Captain Grey heard Hackney, a young American, propose to Woods (not the loiterer, but another man of the same name) to offer the Captain a portion of their scanty allowance of food, as he had shared his with the native. "No," said Woods, "every one for himself under these circumstances; let Mr. Grey do as well as he can, and I will do the same." "Well, then, I shall give him some of mine, at all events," said Hackney, and coming up to Captain Grey, he offered him a morsel of damper and a handful of By-yu nuts, but though the pangs of hunger were so powerful, Captain Grey hesitated to mark the approach of civilised man in the country of the savage by an act of spoliation; when Kaiber resolved this point by saying: "If we take all, this people will be angered greatly; they will say, 'What thief has stolen here?' track his footsteps, spear him through the heart; wherefore has he stolen our hidden food?' But if we take what is buried in one hole, they will say, 'Hungry people have been here; they were very empty, and now their bellies are full: they may be sorcerers; now they will not eat us as we sleep.'" On this the contents of one of the holes were shared amongst the men, after which they started. One of the men had an unsuccessful shot at a native dog, "a fine fat fellow," but Captain Grey killed a hawk, and after giving the head and entrails to Kaiber, he divided the rest equally with Hackney. After a painful walk under an intensely hot sun, through an arid country containing neither water nor signs of animal life, and confined only with the prickly scrub, they encamped in a very distressed state.

16th.—Searched the dried-up bed of a considerable stream for water, but none was found, though some of the pools were twelve or fourteen feet deep, and there was a native well seven feet in depth. While thus engaged the sun became intensely hot, and it was with great difficulty we witnessed the wrinkled faces of our fellows sought for water with eager piercing eyes, and an air of intensc scrutinizing watchfulness, peculiar to those who search for that on which their lives depend." Captain Grey has graphically described this scene:—"One while they explored a shallow stony part of the bed, which was parched up and blackened by the fiery sun; the next moment another pool would be discerned ahead, the depth of which the eye could not at a distance reach; now they hurried on towards it with a dreadful look of eager anxiety; the pool was seen, the bottom reached, but alas! no water: the wants of nature had produced a maniacal air of utter despair. As long as they remained on the banks of this river bed a glimmering of hope remained; but I felt convinced (says Captain Grey) from the general appearance of the country, that there was not the slightest probability of our finding water there, and resolved, therefore, still to continue a direct course. When I gave this order, the weak-minded quailed before it: they would rather have perished wandering up and down those arid and inhospitable banks, than have made a great effort, and have torn themselves away from the vain and delusive hope this watercourse held out to them." Before night they reached some dried-up swamps, in the midst of which they encamped, but no water could be found, though often in the night they started up in search of it. Their lives now depended on the chance of finding water within a very short time. The men had been one night and two days without either food or water, as flour could not be eaten without the latter; but of flour and a table-spoonful or two, the remainder being entirely destitute of provisions. Captain Grey suffered less than the others, excepting the native, as he habitually took a very small quantity of water, and his mind was occupied and amused by subjects which men
without education or with little intelligence do not comprehend, and therefore they are the first to be borne down by despondency. Captain Grey kept his journal, read the New Testament, and therefore his spirit was, as he says, "always good."

17th.—This day, started before daybreak, and, as they moved along, sucked the dew from reeds and shrubs, a resource which failed at sunrise. Hunger and thirst had now so exhausted the men, that they were unable to proceed more than a few hundred yards at a time, when some of them united, and therefore most of them concluded to wait for Captain Grey to wait for them. At two o'clock in the afternoon only eight miles had been accomplished. The sun shone fiercely, and they were apparently in a great tract of arid country. The groans of the men were painful to hear, and their thirst so agonizing, that they drank their urine. Captain Grey now resolved to set out with Kaiber in a last desperate search for water, while the men rested. He soon began to stumble and fall from excessive weakness, and, after wandering about for some time, Kaiber declared he had lost his way. At first Captain Grey believed him, and fired his gun, but in vain listened for a repetition of the signal; as the various reflections which the circumstance suggested were passing through his mind, he spoke in a most calm manner, outwardly without saying that he had saved himself and left the others to perish, the native sat keenly eyeing every movement of his features. At length he said, "Mr. Grey, to-day we can walk and may yet not die, but drink water; to-morrow you and I will be two dead men, if we walk not now, for we shall then be weak and unable. The other six do not much, and he knows we cannot walk; if we remain with them, we shall all die; but we two are still strong; let us walk." Pauing for a minute, with steadfast look, he added:—"You must leave the others, for I know not where they are, and we shall die in trying to find them." Kaiber had intentionally led Captain Grey astray with a view of inducing him to abandon the party. "Do you see the sun, Kaiber, and where it now stands?" said Captain Grey, on perceiving how matters stood. "Yes," replied Kaiber. "Then if you have not led me to the party before that sun falls behind the hills, I will shoot you: as it begins to sink, you die." This was spoken earnestly, and the threat was intended for execution; but Kaiber still conceived that he might effect his purpose, and added: "I know not, but I am determined to save myself; Captain Grey now threatened to shoot Kaiber immediately, unless he instantly retraced his steps. This rather alarmed him, and he drew farther off, as if about to run away, in which case Captain Grey would never have been able to find the party; so cocking his gun, he called out to the native that he would fire upon him instantly if he went beyond a certain distance; but, Kaiber was conquered, and in an hour Captain Grey rejoined the party, who had been buoyed up by the hope that he had found water during his long absence; but this, alas, was not the case. The symptoms produced by intense thirst were now most painful, and Captain Grey describes those which he himself experienced. "Not only was my mouth parched, but burning, and devoid of moisture, but the sense of sight and hearing became much affected, I could scarcely recognise the voices of the rest; and when uncouth unnatural tones struck upon my ear, it took me some time to collect my thoughts in order to understand what was said, somewhat in the way in which one is obliged to act when found suddenly in a deep sleep. In the same way my sight had become feeble and indistinct but far the most distressing sensation was that experienced upon rising up, after having rested for a few moments; I then felt the blood rush violently to the head, and the feeling of apprehension was as if it were driven through all my veins." Their circumstances were now become so desperate, that Captain Grey determined that they should all make a last struggle for their lives, and announced his intention of proceeding southward, slowly, but steadily, without once stopping until he either found water or dropped from exhaustion. "It is possible," he said, "that you may lingered could be waited for. Every unnecessary instrument was thrown aside, and the men set out with gaunt and haggard looks, and already partially delirious from their sufferings. In an hour and a quarter they had advanced two miles. They had now thirsted with an intolerable and burning thirst for three days and two nights, exposed to the glare of a fierce sun, and all the while exerting themselves as strenuously as their strength would permit. A very few hours must now determine their fate. At this most critical moment they came to a hole filled with moist mud, and Kaiber, being the first to perceive it, drank up nearly one-half of its contents. Captain Grey took some of this liquid; if it could be so called, into his mouth, but it was too thick to be drunk, and he spat it out, through a handkerchief. Each man exclaimed, 'Thank God!' as he threw himself beside this muddy spring, and, swallowing a few mouthfuls, asserted that it was most delicious and had a superior flavour to any water which he had ever tasted. The mud served in some degree to satisfy the cravings of the stomach. The hole was soon emptied, but on scraping it out the water slowly trickled in, and it was probably the sole spring in a vast desert, as numerous birds came to it at nightfall, but Captain Grey's hand was so tremulous that he could not kill any of them. He afterwards proceeded to their roosting-places, and killed one bird. The men cooked a spoonful of flour in the liquid mud. They slept but little during the night, repairing ever and anon to their much-valued waters."

[To be continued.]
With an old falconer, huntsman, and a kennel of hounds,
That never hawked not hunted but in his own grounds.

And a new smooth shovel-board wherein no victuals ever stood."

THE OLD AND YOUNG COURTIER.

No. VII.

SPORTS AND GAMES.

Our ballad-writer has here presented us with a contrast which is scarcely supported by the facts. The "smooth shovel-board" was not new, nor probably more in fashion than when Master Slender, in the "Merry Wives of Windsor," paid "two shilling and twopence apiece" for "two Edward shovel-boards," although certainly Prince Henry, the son of James, was fond of the amusement, and, like Master Slender, was particular in his selection of pieces to play with, as is shown in the following anecdote given by Strutt from a MS. in the Harleian collection:—"Once when the prince was playing at shovel-board, and in his play changed sundry pieces, his tutor, being desirous that even in trifles he should not be new-fangled, said to him that he did ill to change so oft; and therewith took a piece in his hand, and saying that he would play well enough therewith without changing, threw the piece on the board: yet, not so well but the prince, smiling thereat, said, 'Well thrown, Sir.' Whereupon Master Newton, telling him that he would not strive with a prince at shovel-board, he answered, 'You gownsman should be best at such exercises, being not meet for those that are more stirring.' 'Yes,' quoth Master Newton, 'I am meet for whipping of boys.' And hereupon the prince answered, 'You need not vaunt of that which a ploughman or cart-driver can do better than you.' 'Yes, I can do more,' said Master Newton, 'for I can govern foolish children.' The prince, respecting him even in jesting, came from the farther end of the table, and smiling, said, 'He had need be a wise man himself that could do that.' In this little scene the good-humoured forbearance of the prince contrasts most favourably with the petulance of the tutor, and strongly confirms the general opinion as to the disposition and talents of the young Henry. Shovel-boards were expensive, for, like the billiard-table of modern times, they were required to be perfectly level, and much pains were therefore expended on their construction. Dr. Plot, in his 'History of Staffordshire,' says, that "in the hall at Chartley the shovel-board table, though ten yards one foot and an inch long, is made up of about two hundred and sixty pieces, which are generally about eighteen inches long, some few only excepted, that are scarce a foot, which being laid on longer boards for support underneath, are so accurately joined and glued together, that no shovel-board whatever is freer from rubs or castings." The shovel-board does not seem to have ever attained
any gambling pre-eminence, for which it does not seem to have been well adapted—indeed, old Isaak Walton makes it the recreation of two of his anglers, during a rainy afternoon. At a late period it descended to a lower rank, with considerable modifications, under the name of shove-groat, and yet lingered, or did within a few years, in the tap-rooms of low public-houses under that of shove-halfpenny.

As shovel-board was no modern innovation, neither were hawking nor hunting discontinued or discounted, although the former was not in the present state to which it had reached in more remote times, when the possession of a hawk was a mark of nobility, and the falconer was an important officer in most of the households of European courts, as he is nominally still in that of England. Indeed, Shakspere, in 'All's Well that Ends Well,' makes "a gentle astringer," or falconer, the means of introducing Helena to the king:

"This man may help me to his majesty's ear, If he would spend his power—"

and he does so. But Hentzner, in his 'Itinerary,' written in 1598, says that hawking was still the general sport of the English nobility at that time; and Strutt, in his 'Sports and Pastimes,' states "that in the reign of James I., Sir Thomas Monson gave 1000l. for a cast (that is, two) of hawks." In a letter also from Lord Cecil, afterwards Earl of Salisbury, to the Earl of Shrewsbury in 1603, he writes, "and so I end with a release now to you for a field-hawk, if you can help me to a river-hawk that will fly in a high place. Stick not to give gold, so that she fly high, but not else."

We do not intend here to enter into any detailed descriptions of sports or games, but only to notice them in connection with the manners of the different periods in which they were practiced. The persons with whom hawking do not induce us to join in the lament of the ballad shoulders of mutton and custards," to acquire in various ways the estates of the "race of gentry;" to acquire in various ways the estates of the "race of gentry;" to be discharged from the duties of the "race of gentry;" to be discharged from the duties of the "race of gentry;" to be discharged from the duties of the "race of gentry;"

We here gain a glimpse of one of the principal causes of the outcry as to the changes of manners and the deterioration of the country. Commerce and industry were enabled to spring up through the staple trade, to the benefit of the country. Commerce and industry were enabled to spring up through the staple trade, to the benefit of the country. Commerce and industry were enabled to spring up through the staple trade, to the benefit of the country.

The King's Bench is enclosed, there's no good riding; the Counter's full of thorns and bristles (take heed, sir) And bags;"

With regard to hunting, it had been popular from the earliest periods of our history, and so continued, and continues. Queen Elizabeth was very fond of it, and in all her progresses was entertained at the mansions she visited with hunting parties, following the hounds whenever the weather permitted. In 1600, when she was seventy-six years of age, Rowland Whyte writes to Sir Robert Sidney, "Her Majesty is well, and excellently disposed to hunting, for every second day she is on horseback, and continues the sport long." At this time she was residing at her palace of Oatlands. The sport was pursued by James with even more ardour than by his predecessor. Welwood has said of this monarch, that he divided his time between his standish, his bottle, and hunting; the last had his fair weather, the two former his dull and cloudy. His devotion to the sport was so extreme, that serious complaints were made of the interruption it occasioned to the business of the state. In 1604, while residing at Royston, Mr. Edmund Lascelles writes thus to him of the Earl of Shrewsbury:

enguins."

* State—this word is commonly used for estate.
† Nichol's "Queen Elizabeth's Progresses."
standing went a hunting. The next day, when they
were on the field, Jowler came in amongst the rest of
the hounds; the king was told of him, and was very
glad, and, looking on him, spied a paper about his
neck, and in the paper was written, 'Good Mr. Jow-
ler, we pray you speak to the king (for he hears you
every day, and doth he know that it will please
his majesty to go back to London, for else the country
will be undone; all our provision is spent already,
and we are not able to entertain him longer.' It was
taken for a jest, and so passed over, for his majesty
intends to lie there yet a fortnight.'*

Bear-baiting and bull-baiting were pursued with as
much avidity under James as during the lifetime of
his predecessors. A passage from 'Progresses'† there is
detailed a long account of the baiting of a lion by
three dogs in the Tower. James also introduced horse-
racing into England, and public races were established
at several places, particularly at Newmarket, at which
he was often present. Bear-baiting continued indeed
so long as far as that, Thomas Cartwright, in his 'Admoni-
tions of the Times,' in 'Use of Common Prayer,'
published in 1572, says, 'If there be a bear or a bull
to be baited in the afternoon, or a jackanapes to ride
on horseback, the minister hurries the service over in
a shameful manner, in order to be present at the
show.' The theatre also contained a general source of
amusement, but perhaps the following extract from the
'Progresses of Queen Elizabeth' may be the most
satisfactory picture of the enjoyments of our ancestors,
and little or no alteration took place as to them during the
time of James I. 'Without the city are some theatres,
where English actors represent, almost every day, tragedies and comedies to very nu-
merous audiences; these are concluded with music,
which the companies put in, and the excessive applause
that is present. Not far from one of these theatres,
which are built of wood, lies the royal barge, close to
the river; it has two splendid cabins beautifully or-
amented with glass windows, painting, and gilding; it
is kept upon dry ground, and sheltered from the
weather. There is still another place, built in the form
of a theatre, which serves for the baiting of hounds
and bulls: they are fastened behind, and then worried
by great English bull-dogs; but not without great
great risk to the dogs, from the horns of the one and the teeth
of the other; and it sometimes happens they are killed
upon the spot: fresh ones are immediately supplied in
the place of those that are wounded or tired. To
the entertainment there often follows that of a blind-
ed bear, which is performed by five or six men stand-
ing circularly with whips, which they exercise upon
him without any mercy, as he cannot escape from them
because of his chain; he defends himself with all his
force and skill, throwing down all who come within
his reach and are not active enough to get out of it,
and tearing the whips out of their hands and breaking
them in pieces. And everywhere else, the
English are constantly smoking tobacco, and in this
manner: they have pipes on purpose, made out of
clay, into the further end of which they put the herb,
so dry that it may be rubbed into powder; and putting
fire to it, they draw the smoke into their mouths,
which they puff out again through their nostrils like
fumes, along with plenty of phlegm and breaking
from the head. At these theatres fruits, such as
apples, pears, and nuts, according to the season, are
carried about to be sold, as well as ale and wine.'**

But gambling continued through both periods, as it
had been for many ages previous, the besetting sin
of the English. 'Laws had been in vain enacted against
it in the time of the Saxons. Cards and dice were
the chief instruments, and as early as about 1350
Chaucer thus writes of the latter in his Pardoner's
Tale:

"Hazard is very mother of losing;
And of deceit, and cursed forswearing;
Blaspheming of Christ, manslaughter, and murdering also
For to be held a common hazardous;
And ever the higher he is of state,
The more he is taken despite;
For to find a prince with hazard's;
In all governance and police,
He is as by common opinion
Yield the lease in reputation."

During the reign of Elizabeth it was not much encour-
aged at court, and it was one of the regulations of Gray's
Inn, 'that all playing at dice, cards, or otherwise, in
the hall, buttery, or butler's chamber, should be thence-
forth barred and forbidden at all times of the year, the
twenty days in Christmas only excepted;' but on the
accession of James it made rapid strides. In 1604-5, on
the marriage of Sir Philip Herbert, the day after New
Year's Day, 'the king played in the presence, and as
for ill luck seldom comes alone, the bridge-son, that
threw for the king, had the good fortune to win
1000L, which he had for his pains; the greatest part was
lost by my lord of Cranborne.'*** This vice was of course
accompanied with its almost inseparable associate, cheat-
ing, which was so common, even among what were
called gentlemen, as to be scarcely disavowed, but looked on as a mark of cleverness. Strutt observes
that professed gamblers "will not trust to the deter-
mination of fortune, but have recourse to many ne-
arious arts to circumvent the unwary; hence we hear
of loaded dice, and dice of the high cut. The
formor are made heavier on one side than the other by the
insertion of a small portion of lead, and the latter may
be understood by the following anecdote in an anony-
monous MS., written about the reign of James I., and
preserved in the Harleian Collection:—"Sir William Her-
bort playing at dice with another gentleman, there
rose some questions about a cast. Sir William's antu-
gonist declared it was a four and five; he as posi-
tively insisted that it was a five and six; the other
flew to swear, with a bitter imprecation, that it was as
he said. Sir William then replied, 'Thou art a per-
jured knave! for give me a sixpence, and if there be
a four upon the dice I will return you a thousand in the place of those that were wounded or tired. To
pounds: at which the other was presently abashed,
without a four.'**

The dramatists, from Shakspeare's

"For gourd and fullam holds,
And high and low beguile the rich and poor"—
cant terms for different sorts of cheating), which he
puts into the mouth of Pistol, down to the latest
writers of the time of Charles I., are full of allusions
to these practices. Of the infatuation produced by this
passion, and of the absurdities to which it led, we
have a humorous instance in the 'Wife of Winter,'
a play by Thomas Heywood, published in 1638, but
probably written much earlier. Some gamsters
having just left the table, one of the losers endeavours
to provoke a quarrel by daring the winners to con-
tradict the extravagant assertion that his hat is not
black nor made of wool, but the winners assent to
everything. At length the loser exclaims—

"Ah! flogs,
Must you be set on gold, and not a jot of silver in my purse?
A bale of fresh dice! Ho! come, at this ring."

Gaming recommendes, and fortune changes. The

* Mr. Chamberlain to Mr. Winwood, in 'Progresses
of James I.'
First Impressions in a Tropical Country.—I took a walk in the country around Bahia this evening, and experienced those wild and unspeakable feelings which accompany the first entrance into a rich tropical country. I had arrived just towards the close of the rainy season, when everything was in full verdure and new to me.

The luxuriant foliage expanding in magnificent variety, the brightness of the stars above, the dazzling brilliancy of the fire-flies around me, the breezes laden with balmy smells, and the busy hum of insect life making the deep woods vocal, at first oppress the senses with a feeling of novelty and strangeness, till the mind appears to hover between the realms of truth and falsehood.—Captain Grey's Expedition of Discovery in Western Australia.

Miniatures on Marble.—Thin polished plates of white marble have been recently adopted by several French artists, as a substitute for ivory in miniature painting. The slices of marble are cemented down upon a sheet of pasteboard, to prevent danger of fracturing; they are said to take the colour with great freedom, could be earned from 10 to 15 a month without the smallest work, or covering; they had no soap to wash themselves or their clothes, yet they submitted cheerfully to all their privations, considering them as necessary attendants upon their situation.

Two of these out-settlers were gentlemen, not only by birth, but also in thought and manner; and, to tell the truth, I believe they were far happier than many a young man I have seen, who, in the English language, a burden to himself and his friends; for must be borne in mind that they were realizing a future independence for themselves. Many of the ills and privations which they endured were, however, unnecessary, and were entailed upon them by the mistaken system that (up to a recent period) has been pursued at Swan River, of having but one knife, an old clasp one; there was but one small bed, for one person, the others sleeping on the ground every night, with little or no covering; they had no soap to wash themselves or their clothes, yet they submitted cheerfully to all their privations, considering them as necessary attendants upon their situation.
THE TROUT.

The trout is common in all the rivers and lakes of Great Britain, and affords excellent diversion to the angler, though great patience and skill are required in catching it, in consequence of its vigilance and the extreme rapidity of its movements. It is generally assumed that several species exist, but it is more probable that the soil and situation of the different rivers which this fish inhabits cause the varieties in size and colour which have been noticed by British naturalists. The trout sometimes lives to a great age, and attains an enormous weight.* Mr. Yarrell, in his ‘History of British Fishes,’ tells us of a trout caught at Salisbury in a little stream branching from the Avon, whose weight, on being taken from the water, “was found to be twenty-five pounds. Mrs. Powell, at the bottom of whose garden the fish was first discovered, placed it in a pond, where it was fed and lived four months, but had decreased in weight at the time of its death to twenty-one pounds and a quarter.” Mr. Oliver, in his ‘Scenes and Recollections of Fly fishing,’ speaks of a trout “taken in the neighbourhood of Great Driffield, in September, 1832, which measured thirty-one inches in length, twenty-one in girth, and weighed seventeen pounds.” Trout of twelve and fifteen pounds weight have been caught in the Thames near Kingston and Chertsey, some measuring twenty-eight inches and upwards in length. Izaak Walton says:—“It is well known that in the Lake Leman (the Lake of Geneva) there are trouts taken of three cubits long; as is affirmed by Gesner, a writer of good credit; and Mercator says the trouts that are taken in the Lake of Geneva are a great part of the merchandize of that famous city. And you are further to know, that there be certain waters that breed trouts remarkable both for their number and smallness. I know a little brook in Kent, that breeds them to a number incredible, and you may take them twenty or forty in an hour, but none greater than about the size of a gudgeon.” It has been found difficult to ascertain what the greatest age is that a trout may attain. Mr. Oliver says that in 1809 “a trout died which had been for twenty-eight years an inhabitant of the well at Dumbarton Castle. It had never increased in size from the time of its being put in, when it weighed about a pound; and had become so tame, that it would receive its food from the hands of the soldiers.” Mr. Yarrell informs us that “in August, 1826, the ‘Westmoreland Advertiser’ contained a paragraph stating that a trout had lived fifty-three years in a well in the orchard of Mr. William Mossop, of Board Hall, near Broughton-in-Furness.”

The trout is justly esteemed admirable food: it is considered to be in perfection in the month of May. “The trout,” says Izaak Walton, “is a fish highly valued, both in this and foreign nations. He may be justly said, as the old poet said of wine, and the English say of venison, to be a generous fish; a fish that is so like the buck, that he also has his seasons; for it is observed that he comes in and goes out of season with the stag and buck. Gesner says his name is of a German offspring; and says he is a fish that feeds clean and purely, in the swiftest streams, and on the hardest gravel; and that he may justly contend with

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* For examples of the variations of size, see ‘Penny Mag.’ No. 632
all fresh-water fish, as the mullet may with all the sea-
fish, for precendency and daintiness of taste; and that
being in right season, the most dainty palates have
allowed precendency to him. The trout usually feeds
upon small fish, frogs, and insects. In Mr. Stoddart's
"Art of Angling as practised in Scotland," the art
ment is mentioned as being made with some trout.
A few years back, for the purpose of ascertaining the
effect produced upon them by different food. "Fish
were placed in three separate tanks, one of which was
supplied daily with worms, another with live minnows,
and the third with those small dark-coloured water-
fish which they have found not to do so well on the
face of the rocks and sheltered places. The trout fed
with worms grew slowly, and had a lean appearance;
those nourished on minnows, which, it was observed,
didn't at all with great voracity, became much larger;
while such as were fattened upon flies only attained
in a short time prodigious dimensions, weighing twice
as much as both the others together, although the
quantity of food swallowed by each entailed similar
trouble and expense were devoted, and fish of seven and eight
pounds weight were not uncommon. A gentleman at
Lacklamn, in the same county, had a favourite water-
spaniel that was condemned to suffer death for killing
all the carp in his master's ponds, but was reprieved
at the desire of Mr. Popham, who took charge of him,
In Mr. Stoddart's book, entitled "Salmonia," it was
mentioned as being made with so in a trout, a somewhat
quietly, for in a stream the bait will not be
so well discerned. I say, in a quiet or dead place,
near to some swift; there draw your bait over the top
of the water, to and fro, and if there be a good trout in
the hole, he will take it, especially if the night be
dark, for then he is bold, and lies near the top of the
water, watching the motions of any frog or water rat
or mouse that swims its next points, and the light
he hunts after, if he sees the water but wrinkle or
move in one of these dead holes, where these great old
trouts usually lie, near to their holds: for you are to
note, that the great old trout is both subtle and fearful,
and lies close all day, and does not usually stir out of
his hold, but lies in it as close in the day as the tim-
bunk care does in night. They will either is either is
seldom in the day, but usually in the night,
and then the great trout feeds boldly. And you must
fish for him with a strong line, and a little hook;
and let him have time to gorge your hook, for he does
not usually forsake it, as he often will in the day-fishing.
And if the night be not dark, then fish with an arti-
ficial fly of a light colour, and at such times as usually
will sometimes rise at a dead mouse, or a piece of
cloth, or anything that seems to swim across the water
or be in motion. This is a choice way, but I have not
often used it, because it is void of the pleasures that
such days as these, that we two now enjoy, afford an angler.
And you are to know, that in Hampshire, which I
frequently exceed all other parts, much art is used
in the selection of the water, as they accept the bait very soon.
and some few in the summer.

"You are to know," says Izaak Walton, "there is
night as well as day fishing for a trout; and that in
the night the best trouts come out of their holes; and
the manner of taking them is on the top of the water,
with a great lob or garden-worm, or rather two, which
may be put into a dead hole, and you will find them
somewhat quietly, for in a stream the bait will not be
so well discerned. I say, in a quiet or dead place,
near to some swift; there draw your bait over the top
of the water, to and fro, and if there be a good trout in
the hole, he will take it, especially if the night be
dark, for then he is bold, and lies near the top of the
water, watching the motions of any frog or water rat
or mouse that swims its next points, and the light
he hunts after, if he sees the water but wrinkle or
move in one of these dead holes, where these great old
trouts usually lie, near to their holds: for you are to
note, that the great old trout is both subtle and fearful,
and lies close all day, and does not usually stir out of
his hold, but lies in it as close in the day as the tim-
bug, care does in night. They will either is either is
seldom in the day, but usually in the night,
and then the great trout feeds boldly. And you must
fish for him with a strong line, and a little hook;
and let him have time to gorge your hook, for he does
not usually forsake it, as he often will in the day-fishing.
And if the night be not dark, then fish with an arti-
ficial fly of a light colour, and at such times as usually
will sometimes rise at a dead mouse, or a piece of
cloth, or anything that seems to swim across the water
or be in motion. This is a choice way, but I have not
often used it, because it is void of the pleasures that
such days as these, that we two now enjoy, afford an angler.
And you are to know, that in Hampshire, which I
frequently exceed all other parts, much art is used
in the selection of the water, as they accept the bait very soon.
and some few in the summer.

SUFFERINGS OF THE PARTY COMPOSING
CAPTAIN GREY'S EXPEDITION OF DIS-
COVERY IN WESTERN AUSTRALIA.

On the morning of the 18th the whole party felt
stronger, but were still exceedingly feeble. This day
they reached a river which abounded with fresh-water
fish. The weather was stormy and intensely cold, and in their present
condition all suffered severely. Captain Grey had
lost the power of moving his extremities when the
morning came, and the rheumatism attacked him in
the hip, where he had received a wound from a native
spear in an attack made upon him and two others by a
party of savages, who had met with the party.

On the 19th the tasted no food, and travelled twen-
ty-one miles. The night was again stormy and cold.

20th. All rose crippled and stiff from cold and wet.
Captain Grey states that from weakness and weariness he "had much the same inclination to sink into the sleep of death that one feels to take a second slumber in the morning after great fatigue." But he roused his energies, and the party set out. At noon they had only advanced at the rate of a mile and a quarter an hour, when their faces were covered by a cloud, and one of whom, named Imbat. Captain Grey had befriended at Perth. The wretched wanderers were now regaled with frogs, roasted by-yu nuts, Captain Grey being treated with a fresh-water tortoise. Imbat reported that one of the colonists was at a hut about seven miles off, where he had provisions, and Captain Grey started for the spot as an hour and a half elapse time refreshed, but the hut was deserted. Imbat again put his culinary talents into exercise for the captain's benefit, rallying him for the apparently prolix task which he had undertaken. "What for do you," said Imbat, "who have plenty to eat, and much money, walk so far away in the bush? You are thin, your shanks are long, your belly is small—you had plies, with your aversion to fatigue, to keep up your condition, captain Grey replied: "Imbat, you comprehend nothing, you know nothing." "I know nothing!" answered he; "I know how to keep myself fat: the young women look at me and say, Imbat is very handsome; he is fat. They will look at you and say, he not good—long legs—what do you know? why do you not stop there?" "You know how to talk, long tongue," was the captain's reply; on which Imbat laughed immediately, saying, "And I know how to make you fat," suit- ing the action to the word by stuffing his host with frogs and yu nuts. The remainder of the party reached the hut, where they all slept, and thus were in some degree sheltered from the rain. Some tea was discovered, which, with the frogs, furnished a grateful entertainment.

April 21.—An hour and a half before day-break Captain Grey was on his road to Perth, accompanied by Don, who having appointed a place where he would send provisions for the others. Arriving at the cottage of a colonist named Williams, who resided farthest north from Perth, and where he had often obtained a glass of milk, he was taken for a crazy Malay who was in the habit of calling at the cottage. "Why, Magic, what's the matter with you?" said Mrs. Williams. Matters being explained, water was put on to boil, and Captain Grey composed a comfortable breakfast, and soon afterwards the remainder of the party came up, and he proceeded onward, not without suffering greatly from too profuse a meal. He next reached the house of a friend, who did not know him, and having taken a tea-spoonful of brandy, again went on, and soon reached Perth, and had an immediate in- terview with the governor, who directed him to proceed without delay to the scene of his late trouble in the Tower of London, and hence he had retired to rest the remainder of the men composing the advanced party arrived, and thus six individuals were preserved.

Not an instant was lost in sending a party in search of the men from whom Captain Grey had parted on the 16th, but we have not space for an account of their proceedings. One man was found asleep on a part of the ground in front of native huts on the 6th of May, without having discovered the five others. A fresh party was then sent after them, and two days afterwards Mr. Walter, the surgeon, reached Perth alone. On the 16th of May, three of the others were discovered by the exploring party in a dreadful condition. They had been three days without water, and their canteens contained only urine. Ten minutes before, one of the men had been on his knees supplicating Providence for succour from one of whom, certainly could not have survived more than another half hour, when they came upon a party of natives, one of whom they discovered, which, with the frogs, furnished a close shut, having, wax lights burning up on the cup- board, I beheld him, as me seen, drawing fast to board, I beheld him, as me seen, drawing fast to

CARDINAL WOLSEY AFTER HIS FALL.

"Upon Monday in the morning, as I stood by his bed-side, about eight of the clock, the windows being close shut, having wax lights burning upon the cupboard, I beheld him, as me seemed, drawing fast to his end. He perceiving my shadow upon the wall by his bed-side, asked who was there: 'Sir, I am here,' quoited L. 'Forsooth, sir,' said I, 'it is past eight of the clock in the morning.' 'Eight of the clock?' quoited he; 'that cannot be; rehearsing divers times, eight of the clock, eight of the clock.' 'Nay, nay,' quoit he at last, 'but cannot be eight of the clock; you had better be patient: my lord, my lord shall lose your master: for my time draweth near that I must depart out of this world.'"

The rapacity of the king is strikingly exhibited in the following passage: "And after dinner, Master Kingston sent for me (Cavendish) into his chamber, and at my being there, said to me, 'So it is that the king hath sent me letters by this gentleman, Master Kingston, one of your old companions, who hath been of late in trouble in the Tower of London for money that my lord should have at his last departing from him, which now cannot be found. Wherefore the king, at this gentleman's request, for the declaration of his truth, hath sent him hither with his grace's letters directed unto me, commanding me by virtue thereof that on that behalf, and to have my counsel herein, how it may be done, that he may take it well and in good part. This is the chief cause of my sending for you; therefore I pray you what is your best counsel to use in this matter for the true acquittal of this gentleman?' 'Sir,' quoit I, 'as touching that matter, my simple advice shall be this, that your own person shall not visit him, and in communication break the matter unto him; and if he will not tell the truth, there be that
can satisfy the king's pleasure therein; and in anywise speak nothing of my fellow Vincent. And I would not advise you to tract the time with him; for he is very sick, and I fear me he will not live past tomorrow. Thus we began to put him in remembrance of Christ's morning, at which time I asked him how he did; and so forth proceeded in communication, wherein Master Kingston demanded of him the said money, saying, 'That my lord of Northumberland hath found a book at Cawood that reporteth how ye had but fifteen hundred pounds in ready money, and one penny thereof will of divers of my friends, who wish me and privy by his letters thereof. Wherefore the king hath written unto me, to demand of you if you know where it is become; for it were pity that it should be embezzled from you both. Therefore, I shall require you, in the king's name, to tell me the truth herein, to the intent that I may make just report unto his majesty what answer ye make them. With that my lord paused awhile and said, 'Ah, good lord! how much doth it grieve me that the king should think in me such deceit, wherein I should deceive him of any one penny that I have. Rather than I would, Master Kingston, embezzle, or deceive him of a mitre, I would it were moul't, and put in my mouth; which words he spake twice or thrice very vehemently. 'I have nothing, no, my lord, for to do so. I am as honest a man as thou or had in it any such delight or pleasure, but that I took it for the king's goods, having but the bare use of the same during my life, and after my death to leave it to the king; wherein he hath but prevented my intent and purpose. And for this money that ye demand of me, I assure you it is none of mine; for I have given it to my servants, having taken pains about me, like true and faithful men. Notwithstanding, if it be his pleasure to take this money from me, I must hold me therewith content. Yet I would most humbly beseech his majesty to see me satisfied, of whom I borrowed the same for the discharge of my conscience.' "Sir, quoth Master Kingston, 'there is no doubt in the king; ye need not to mistrust that, but when the king shall be advertised thereof, to whom I shall make report of your request, that his grace will do as shall become him. But, sir, I pray you, where is this money? Master Kingston,' quoth he, 'I will not conceal it from the king; but to you, I pray, let him take it.' 'I have not the grace of God. Take a little patience with me, I pray you.' 'Well, sir, then will I trouble you no more at this time, trusting that ye will show me to-morrow. '"Howbeit my lord waxed very sick, most likelyest to die that night, and often swooned, and, as me thought, drew fast toward his end, until it was four of the clock in the morning, at which time I asked him how he did: 'Well,' quoth he, 'if I had any meat, I would give me some; 'Sir, there is none ready,' said I. 'I win,' quoth he, 'ye be the more to blame, for you should have always some meat for me in a readiness, to eat when my stomach serveth me; therefore I prayer you get me some; for I intend this day, God willing, to make me strong, to the intent I may occupy myself in confessions, being ready to die. Let a gentleman of God take a spoonful or two. "Then was he in confession the space of an hour. And when he had ended his confession, Master Kingston bade him good-morrow (for it was seven of the clock in the morning), and asked him how he did. 'Sir,' quoth he, 'I tarry but the will and please of God, to render unto him my simple soul into his divine hands.' "Then spoke Master Kingston, 'with the grace of God, ye shall live, and do very well, if ye will be of good cheer.' Master Kingston, my disease is such that I cannot live; I have had some experience in my disease, and thus it is: I have a flux, with a continual fever; the nature whereof is this, that if there be no alteration with me of the same within eight days, then must either ensue excoriation of the entrails, or frenzy, or else present death; and the best remedy of the three. And as I suppose, this is the eighth day; and if ye see in me no alteration, then is there no remedy (although I may live a day or twain) but death, which is the best remedy of the three.' "Nay, sir, in good faith," quoth Master Kingston, 'you be in such dolor and pensiveness, doubting that thing that indeed ye need not. Yet, if it be your pleasure to commit this matter to me, I shall give you such advice as may satisfy you both. Well, well, Master Kingston,' quoth he, 'I see the matter against me how it is framed; but if I had served God as diligently as I have done the king, he would not have given me over in my grey hairs. Howbeit this is the just reward that I must receive for my worldly diligence and pains that I have had to do him service; only for the chief part of it, as pleasure, not regarding my godly duty. Wherefore I pray you, with all my heart, to have me most humbly commended unto his royal majesty; beseeching him in my behalf to call to his most gracious remembrance all matters proceeding between him and me, from the beginning of the world unto this day, and the progress of the same: and most chiefly in the world unto his death; and what is newly begun between him and the good queen Katherine), then shall his conscience declare whether I have offended him or no. He is sure a prince of royal courage, and hath a princely heart; and rather than he will either miss or want any part of his will or appetite, he will put the loss of one-half of his realm in danger. For I assure you I have been kneeling before him in his private chamber on my knees, the space of an hour or two, to persuade him from his will and appetite: but I could never bring to pass to dissuade him therefrom. Therefore, Master Kingston, if it chance hereafter you to be one of his privy council, as for your wisdom and other qualities ye are meet to be, I warn you to be well advised and assured whether it be put in his head, for ye shall never put it out again.'" "The narrative then goes on to exhibit a long speech of the Cardinal's against "this new pernicious sect of Lutherans." At last Wolsey said: "Master Kingston, farewell; I can no more, but wish all things to have good success. My time draweth on fast. I may not get me some; for I intend this day, God willing, to the ghost, and thus departed he this present life. And makemestrong, tothe intent I may make just report unto his majesty what answer ye maketherein.' With that my lord paused awhile and said, 'Ah, good Lord! how regarding my godly duty. Wherefore I pray you, with all my heart, to have me most humbly commended unto his royal majesty; beseeching him in my behalf to call to his most gracious remembrance all matters proceeding between him and me, from the beginning of the world unto this day, and the progress of the same: and most chiefly in the world unto his death; and what is newly begun between him and the good queen Katherine), then shall his conscience declare whether I have offended him or no. He is sure a prince of royal courage, and hath a princely heart; and rather than he will either miss or want any part of his will or appetite, he will put the loss of one-half of his realm in danger. For I assure you I have been kneeling before him in his private chamber on my knees, the space of an hour or two, to persuade him from his will and appetite: but I could never bring to pass to dissuade him therefrom. Therefore, Master Kingston, if it chance hereafter you to be one of his privy council, as for your wisdom and other qualities ye are meet to be, I warn you to be well advised and assured whether it be put in his head, for ye shall never put it out again.'"
A DAY AT A COPPER AND LEAD FACTORY.

Among the three or four public thoroughfares leading from Holborn to Fleet Street, is one wherein the "clinking of hammers" may be heard at all hours of the day, and frequently of the night too. The labours of the "Copper-smith" are in no part of London exhibited on a more extensive scale than in Shoe Lane, the thoroughfare here alluded to, in which are many factories for articles of copper, and also of brass, lead, tin, and other metals. To one of these factories, viz., that of Messrs. E. and W. Pontifex and Wood, we shall direct our attention in the present article, those gentlemen having liberally given the requisite permission.

As we have endeavoured in each number of this series of supplements to give a brief outline of some one particular branch of manufacture, in connexion with the establishment visited, we must here make a remark or two on the mode in which many of the manufactures in metal are conducted. All the iron, the copper, the lead, the tin, of which such innumerable articles are manufactured in London, come to the metropolis in a more or less prepared state. The iron, for example, is brought into the state of 'cast-iron' or 'pig-iron' or 'bar-iron' at the iron-works in Wales, Scotland, or the Midland Counties; and is re-cast or re-forged on a smaller scale in London. So likewise the copper, the tin, and the lead are brought into a purified state at the smelting-works in the country, and converted into the various forms at the London establishment. It therefore often happens that the routine of operations necessary for one kind of metal so nearly resembles that required for another, as to lead to the combination of both under one establishment. This is the case at the factory to which our attention will be here directed, and indeed the combination of trades is here so considerable, that a further explanation is necessary. Messrs. Pontifex and Wood undertake the entire arrangements connected with the 'fitting-up' of sugar-refineries, distilleries, and breweries, in all of which copper utensils are used on an extensive scale; and the iron and other metal work required is also finished and adjusted at the establishment. The wooden vessels called 'backs' and 'vats,' used in these three branches of manufacture, are likewise made here, as are also lead-pipes and sheet-lead. The various trades, therefore, of 'copper-smiths,' 'brass-founders,' 'engine-makers,' 'lead-manufacturers,' 'back and vat makers,' and others to be enumerated hereafter, are all combined by this firm.

Under these circumstances, a detailed account of all the operations would be wholly beyond our range in this article: we shall therefore only give a general description of the factory and its internal economy, together with the operations of the copper, lead, and mixed-metal manufacture.

On proceeding from Holborn to Farringdon Market,
through the narrow, crooked thoroughfare of Shoe Lane, we come to an open warehouse, on the outside of which are generally cranes, and porters employed in loading waggons with various manufactured articles of lead or copper. Into this warehouse, which immediately adjoins the northern side of the market, we enter, and see around us a mixed assemblage of rolls of lead, coils of pipe, cog-wheels, parts of machinery, and other articles of metal. Before analyzing the dark, the dirty, the busy, the noisy scene which the ground-floor of the factory presents, we will descend a flight of iron steps leading therefrom, and grope our way through a series of underground halls, where we come to a long vault where the melted metal is poured to form large and thick masses of lead. Adjacent to this is a powerful crane for hauling up the lead and passing it on to a system of rollers. Then ensues the apparatus (to be described in a future page) for working the lead into thin sheets. At another part of the range, but included in what is termed the lead-founding shop, the mechanical apparatus for smelting the lead and tin for forming pipes and tubes; and in another are the arrangements whereby the pipes, thus cast, are elongated and made ready for use.

From this department we cross over to that devoted to the copper-manufacture; and here such is the din of hammers and clatter, that a stranger finds it no easy matter to collect his ideas and see what is going forward. Men wielding large hammers are on every side fashioning vessels and articles of copper: here a sugar-pan, there a sugar-filtering cylinder, in one place a boiler, in another a copper, in a third a still, in a fourth a worm. The metal being very sonorous, and being held on an iron anvil while struck by an iron hammer, yields sounds much more strong than musical. On one side are forges for heating the metal necessary for soldering, or, as it is more generally termed, 'braizing,' such articles of copper as cannot be jointed by rivets; and here and there are small, open, temporary forges, employed for annealing the copper during the progress of the manufacture. Some of the huge vessels seen in the factory, indeed, are examples of the modern improvements in the mode of conducting the sugar-refinery, for which the vessels are intended; this is especially exemplified by the large clarifying cylinders now occasionally used in a certain stage of the sugar-manufacture, some of which are sixteen feet in height. Our frontispiece represents a part of the machinery and assemblage of the vessels and articles of copper: here as sugar-pan, there a sugar-filtering cylinder, in one place a boiler, in another a copper, in a third a still, in a fourth a worm. The mechanism and vessels, when completed, will freight a 700-ton ship to St. Petersburg.

We now ascend to the main floor of the factory, extending to a depth of a hundred and fifty or two hundred feet from west to east. The northern portion of this range is principally occupied by the mechanism connected with the lead-manufacture; while the southern relates more particularly to the manufacture of copper. On one side we see a large furnace, wherein five or six tons of lead are being melted at sounds much more strong than musical. On one side are forges for heating the metal necessary for soldering, or, as it is more generally termed, 'braizing,' such articles of copper as cannot be jointed by rivets; and here and there are small, open, temporary forges, employed for annealing the copper during the progress of the manufacture. Some of the huge vessels seen in the factory, indeed, are examples of the modern improvements in the mode of conducting the sugar-refinery, for which the vessels are intended; this is especially exemplified by the large clarifying cylinders now occasionally used in a certain stage of the sugar-manufacture, some of which are sixteen feet in height. Our frontispiece represents a part of the machinery and assemblage of the vessels and articles of copper: here as sugar-pan, there a sugar-filtering cylinder, in one place a boiler, in another a copper, in a third a still, in a fourth a worm. The mechanism and vessels, when completed, will freight a 700-ton ship to St. Petersburg.

In the ground-story are also the 'foundry' and the 'smithery,' which, like the parts just described, require a solid foundation for the heavy furnaces, &c., contained therein. In the 'foundry' are all the arrangements for casting small works in brass, in bell-metal, in gun-metal, and in other metals, and the components of lead, and tin are the component ingredients. The melting-furnaces, sunk below the level of the ground,
the sand-moulds for casting, and other parts of the arrangements, bear a considerable resemblance to those presented in the bell-foundry noticed in our March 'Supplement.' Here too is an air-furnace, for use in cases where a higher heat is required. The 'smithery' presents the usual assemblage of forges, anvils, and other apparatus necessary for the forging of iron. Nearly all the wrought-iron required in the mechanism fitted up at the factory is forged in this 'smithery.'

Among the mechanical arrangements for facilitating the removal of heavy goods from one part of the factory to another, we noticed an ingenious railway fixed near the ceiling or roof, whereby boilers, coppers, stills, engines, &c., suspended from a wheeled carriage or frame, could be easily moved along above the heads of the workmen without disturbing the manufacturing arrangements beneath. This contrivance arose out of the necessity for economizing space, but we are inclined to think that it might be advantageously employed under many other circumstances in large factories.

Let us now pass upwards from the ground-floor, and glance through the upper ranges of shops. The largest part of the first floor is occupied chiefly as a warehouse for finished goods in copper, gun-metal, lead, &c. Here, too, are the various offices and counting-houses, and also a room appropriated to the draughtsmen. In the fitting-up of large factories, such as sugar-refineries and distilleries, there are, as may be supposed, many drawings, plans, sections, &c., necessary not only for making a contract and showing the proposed action of the whole machinery, but as working drawings for the guidance of the workmen. The preparation of such drawings is effected in the office here alluded to, where labelled drawers are devoted to the reception of different patterns, drawings, &c., necessary for the making of the various machines and other apparatus. The dross which arises during the melting of pigs of lead, known as lead-ashes, the clip of the various pieces required to be cast in the foundry, &c., are picked out from the heap of dirt by hand, are washed well in water, being held in sieves moved ticketed, so as to be readily found when wanted. To such a manner, to allow all the dirt to be washed away from the small particles of metal: this is effected by burning the dirt. The pieces of metal which are too fine to be picked out from the heap of dirt by hand, are washed well in water, being held in sieves moved in such a manner as to allow all the dirt to be washed away from the small particles of metal: this is effected by men called in the factory 'dirt-washers,' who have acquired great dexterity in the management of the sieve. Lastly, the regained metal is exposed to the fierce heat of an air-furnace, whereby it is melted into a uniform state; and in this state it is useful for mixing with new copper, to form a compound metal for various purposes. Many tons of valuable metal are thus annually recovered from the otherwise useless parts of the factory. On several occasions the quantity has amounted to thirty tons per annum, which at seven pence per pound (its estimated value) gives a sum of no mean amount, as the value of the metal regained.

We will now endeavour to follow the routine of some of the processes glanced at in the preceding paragraphs; explaining, as we proceed, the nature of the very effective machines brought into requisition. Perhaps it may be well to speak first of the lead manufacture, as it will aid in the subsequent details relating to copper.

All brass-founders, bell-founders, iron-founders, lead-manufacturers, and similar workers in metal, are desirous of obtaining old metal to mix with new. So it is likewise with the glass-manufacturers, who...
mix 'cullet,' or broken glass, with the flint and alkali for forming new glass; and also broken crucibles in the manufacture of new ones. The old ingredient gives to the new certain valuable qualities not possessed by the latter when used singly; perhaps because the old material has acquired a better amalgamation, a more complete union of its parts, whether it be a metal, or glass, or baked earthenware. Be this as it may, old lead-pipe, old sheet-lead, old copper sheathing from ships, old copper-boilers, old bells—all are bought by the respective founders, to be employed in the construction of new articles.

As the amount of old material is, of course, far beneath the quantity required, we have to speak of the form in which the new metal is brought to the factory. In the case of lead, the new metal is brought to London in the form of pigs, each of which is an oblong mass, about three feet long, six inches wide, and weighing about one hundredweight and a half. To such of our readers as may be willing to trace the progress of the lead manufacture from its commencement, we may mention that in Nos. 186, 188, and 303 of the 'Penny Magazine,' are details sufficient to convey an idea of the earlier processes, the mining operations of the present day, the operations of lead-mining in Britain in the time of the Romans, and the smelting of the ore into the form of pigs. From this latter point we now take up the subject. As for the philosophy of the word 'pig,' applied to the masses of mould. The glistening liquid mass soon flows out, to the weight of about ten or eleven thousand pounds, the dross and impurities being for the most part left behind in the melting-pot. As, however, some impurities or oxidised portions enter the mould, a subsequent removal becomes necessary; and this is effected by drawing the edge of a board carefully over the surface of the hot and liquid metal, the board urging before it all the floating impurities, and leaving a surface very silvery and clear.

After some hours the mass of lead, technically called a 'plate,' is lifted out of the mould by a powerful crane, and placed upon the machine where it is to be rolled into the form of sheets. This machine is very peculiar in its action. It consists of a long frame or bench, about a yard in height, seven or eight feet wide, and probably seventy feet in length. At intervals of every foot or two are transverse rollers, all placed on the same level, so that a heavy body may be rolled from one end of the frame to the other with great facility. About midway along the frame is the 'milling' or rolling machine, consisting mainly of two ponderous rollers, between which the lead is passed; these
are made of iron, the upper one being 15 or 16 inches in diameter, with a weight of three tons, the under one being the same. By means of very ingenious mechanism, the two rollers are placed at any required distance apart, the one above the other, and are also made to revolve in either direction. These being the mechanical arrangements, the process of 'milling' proceeds thus:—

The 'plate' of lead is brought between the rollers, which are opened so as only to receive the lead by compressing it; and the rollers being made to rotate, the plate is drawn in between them. This process is repeated over and over again; the plate passing first from right to left, and then from left to right, the opening between the rollers being gradually reduced by means of an index and graduated dial-plate. The small wooden rollers facilitate the motion of the elongated lead to and fro; and when the length, obtained by reducing the thickness, has become inconveniently great, the piece is cut into two, and each half milled in a similar manner. Thus, the lead continues to pass between the rollers, to the number of seven or eight hundred times, having its thickness diminished and its length increased by regular degrees. From three to four hundred feet in length, with a thickness, at the smallest, of about one inch, the average quantity of roofing-lead produced by these means from one of the 'plates.' The lead is then coiled up in a roll, and in that form is sold to the plumber, who adapts it to his various purposes.

The manufacture of lead-pipe, like that of sheet-lead, combines the processes both of casting and elongating or drawing. Whatever be the required diameter and thickness of the pipe, it is first cast in a short piece of great thickness, and then elongated, by which the thickness becomes reduced. The diameter of the cast piece is, internally, the same as that of the required pipe, the external diameter being that which undergoes reduction. The first process is therefore to cast the short pieces of pipe, which is effected in moulds similar to that represented in the subjoined cut. These moulds measure from two to four feet in height, and are fitted for casting pipe whose diameter varies externally from two to six inches, and internally from half an inch to four inches. The mould consists of two semi-cylindrical halves, which on being brought together form the external contour of the pipe; while a spindle or steel core, running down the centre of the hollow cavity, regulates the internal diameter of the pipe.

A small melting-furnace is appropriated for the pipe-casting, the lead being carefully skimmed from dross while melting; and when the fusion is complete, the melted metal is poured into the mould, the upper end of which is open and the lower end closed. The quantity of lead required for each mould varies from about twenty-four to two hundred pounds, according to the thickness of the pipe. The metal being solidified and sufficiently cool for handling, the two halves of the mould are drawn asunder and the lead removed; the technical name of the 'plug' being applied to the short thick piece of pipe thus produced.

Next ensues the very singular method whereby the 'plug' is elongated to the required dimensions. The 'drawing-bench,' represented in part in the subjoined cut, is a frame about thirty feet long and three in height, having in the middle of its length mechanism for producing the elongation. An endless chain is kept in constant motion round two wheels or rollers, one near the end and the other near the middle of the draw-bench; insomuch that a hook or a clasp connected with one of the links would be forcibly drawn along the bench. A mandril, or steel rod, corresponding in size with the internal diameter of the pipe, is inserted into one of the short pipes or 'plugs,' and then so connected with the endless chain as to be drawn along the bench; but, in its progress, the pipe has to pass through a hole in a steel-plate, or die, rather smaller than the diameter of the lead itself, by which its external diameter becomes somewhat reduced and its length increased. Again and again is the pipe, with its contained mandril, drawn along the frame; the die being exchanged after each drawing and replaced by one of smaller diameter. In producing a two-inch pipe no fewer than sixteen dies are employed, the diameters of which descend in a regular series. The hole through the die is conical, that is, larger on one side of the die than on the other; and the lead enters the hole at the widest part, whereby a process of compression is undergone; but at a certain point in the operations a 'cutting-die' is introduced, that is, one wherein the lead is at once exposed to a cutting-edge, the result of which is, that a thin film is cut or scraped from the whole surface of the pipe. By the time that all this routine is undergone the metal has become more dense and compact, the temperature so high as scarcely to be bearable by the hand, the length greatly increased, and the ex-
ternal diameter proportionally diminished. After this the elongated pipe is removed from the mandril, and is then ready for disposal to the plumber.

Let us now turn our attention to those branches of manufacture in which copper is the principal metal employed. So far as regards the factory under our notice, copper is a more important metal than lead; and we have given precedence to the latter simply as a matter of convenience, because many of the early processes in the copper manufacture may be more readily understood by comparing them with those in lead.

When we find that all copper vessels, and indeed almost all the more important articles made of copper alone, are formed from sheet-copper, it may naturally be asked, how these sheets are produced, and whether or not they are made at the London factories. To answer these questions we must point out the difference between the operations of the copper-miner, the copper-smelter, the copper-mill owner, and the copper-smith. The copper-miners then purchase the ore in this state, and pass it to the copper-mill owner, who converts it into all manner of metallic and earthy substances with which it was combined. The form into which the copper is brought by the smelters is that of square pieces called 'tiles,' measuring nine or ten inches square and an inch in thickness; and 'cakes,' of a somewhat larger size. These 'tiles' and 'cakes' of copper then pass to the copper-smiths, some of which are in many parts of England, but others near Swansea in Wales, and there, by exposure to quantities of quicksilver, the separate pieces are melted and cast into the various forms required by the copper-refiners, depending upon the soundness and perfection of the metal. We saw a piece of copper which had been dished or hollowed in this way, and which, though worth forty guineas if sound, was rendered useless by a flaw in the metal.

The curved piece of copper just spoken of receives its form from the tilt-hammers at the copper-mill, and in successions ever so small the surface receiving marks, but by the density and close-grain of the metal. Melted, and cast into various convenient forms, afterwards to be passed between rollers, if sheet-copper be required. Whatever may be the particular manufacturing arrangements involved, the mode of casting and of rolling or milling may be sufficiently conceived from the details before given respecting lead. Not only is the copper converted into sheets at the copper-mill, but many of the large pieces, employed for sugar-pans and other large vessels, receive their first rude form there also, certain facilities being possessed for that purpose. Lastly come the labours of the copper-smelter, who, after having converted it into all the various forms required by the copper-refiner, the distiller, the brewer, and other manufacturers.

Having premised thus much, we may refer those readers who wish to trace the copper from its earlier forms, to Nos. 173, 175, 177, and 179 of the Penny Magazine, where the ores of copper are described, the principal mines of Europe enumerated, the Cornish of Rome described. Having traced the rudely-shaped pieces into all the various requirements of the smelters is that of square pieces called 'tiles,' and beaten with hammers in everypart, whereby the measuring nine or ten inchessquare and an inch in thickness; and 'cakes,' of a somewhat largersize. These 'tiles' and 'cakes' ofcopper then pass to the copper-smiths, some of which are in many parts of England, but others near Swansea in Wales, and there, by exposure to quantities of quicksilver, the separate pieces are melted and cast into the various forms required by the copper-refiners, depending upon the soundness and perfection of the metal. We saw a piece of copper which had been dished or hollowed in this way, and which, though worth forty guineas if sound, was rendered useless by a flaw in the metal.

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Of the tube is tested by exposure to steam of high pressure for several days; various minor adjustments and other vessels employed by distillers, the copper is exposed to a strong heat for a certain time, and then plunged into water, by which an oxide is removed and the copper softened. For large sheets, this process of annealing is effected on a flat stove about three feet from the ground; the stove being covered with burning fuel, and the copper laid thereon. A cistern of water is kept beneath the floor of the shop, near the stove, into which the heated copper is suddenly plunged, as a means of removing the external oxide. For smaller pieces temporary stoves or fires are adjusted in any convenient part of the shop, a draught being ingeniously supplied by a current of air forced through a flexible tube by the action of the steam-engine. This process of annealing is not effected in connection with the copper becomes so hard as to be in danger of fracture; and it is to remove this hardness that the copper is softened. For large sheets, this process is effected by a peculiar action of the hammer, whereby the metal is as it were driven from the centre towards the circumference, and gradually curled or turned up. But it happens that after a certain amount of hammering, the copper becomes so hard as to be in danger of fracture; and it is to remove this hardness that the process of annealing is not effected in connection with the manufacture of copper-plates for engravers. Messrs. Pontifex, will illustrate the means adopted for this purpose. All are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper, all are made of sheet-copper.
many small pieces of mechanism made of brass or of some of the numerous compound metals in which copper is an ingredient, and which are usually cast in a melted state before final adjustment. For the production of such articles one department of this factory is appropriated. Pumps, water-clocks, valves, weights, measures, tubes or short pipes—these and scores of other articles are cast in loam or sand in a manner analogous to that of bell-founding. The model or pattern is made of different substances, according to the form of the instrument; and in those instances where an interior cavity is to be formed, wax is used in a mould or model adapted to it. The metal, whether brass, or pot-metal, or bell-metal, or gun-metal, is melted in pots made of Stourbridge clay, by means of pot-furnaces placed beneath the level of the ground, and then poured into the cavities of the sand-mould.

All such articles, when cast, have to undergo many processes before they are fitted for use; and to this object some of the upper shops of the factory are devoted. The internal cavity of various pieces of mechanism has often to be brought to great regularity and smoothness; this is effected at a lathe by means of steel instruments. An internal or an external screw or worm has sometimes to be formed; and this is likewise effected at the lathe, of which there are as many as sixty in one shop, some of a very elaborate and beautiful kind. Sometimes holes are to be drilled, more carefully and regularly than can be effected by the copper-drilling machine or other instruments. Then again parts which work into or outersurfaces of all are to be polished and beautified. All these operations, and many others which we cannot enumerate, constitute a bustling scene of industry in the upper shops of the factory. The various polishing-tools being the chief implements employed. Of the lathes here alluded to, one is a beautiful machine for cutting screws, represented in the subjoined cut: its mechanism is at the same time so extensive and so delicate, that it will cut a screw whose threads are eight inches apart, or one which has a hundred threads to the inch, or one having any intermediate number between these wide extremes. The principle of the machine rests on the combination of two movements—a rotatory motion of the bar to be cut into a screw, and a longitudinal motion of the cutting tool; and the distance between the thread of the screw depends on the ratio between the velocities of these two movements.

We stated, in the commencement of this article, that our description of processes must be confined to two or three branches, being those forming the chief features of this establishment. To show how impossible it would be to go beyond these limits, we will here enumerate the distinct branches of manufacture carried on, comprising works in five or six different kinds of metal. 'Copper-smiths,' for making copperers, boilers, baths, stills, sugar-pans, sugar-clarifying and filtering vessels, coolers, fire-boxes for locomotive engines, &c.; 'copper and steel engraving-plate makers,' whose occupations are implied in the name; 'brass and steel makers,' in relation to the brass-plates for inscriptions; 'fire-engine makers;' 'beer-engine makers;' 'pump-makers;' and, in short, makers of numerous engines and machines, wherein various kinds of metal are employed; 'millwrights,' for making the shafts, wheels, cranks, &c. whereby a moving-power is applied to manufactures (nearly all the machinery processes before they are fitted for contained and worked with in the factory is manufactured there also); 'brass, copper, and gun-metal founders,' for innumerable articles made of those metals; 'brass-turners;' 'gas-meter makers;' 'lead- and sheet-lead manufacturers;' 'pewterers,' for making certain parts of the apparatus used in some distilling and chemical processes; 'copper and steel engraving-plate makers,' for making the mash-tuns, hop-backs, underbacks, coolers, stills, store-vats, and other vessels of wood used in breweries and distilleries; and other branches of a minor character. We do not remember to have seen any other factory wherein such numerous departments of manufacture are carried on at once, although many of these are necessarily here conducted on a small scale.

We have in general made a point of avoiding all allusions to the private economy of manufactories, farther than regards the processes carried on therein; but there is one point on which we will here offer a few remarks. It must be obvious that where some hundreds of men are employed, some working by the day and others by 'piece work,' and where scores of different materials are used, the commercial accounts of a factory must require extreme care, and a well-organized system, to prevent the most inextricable confusion. A merchant who imports foreign produce to sell again at a profit, has comparatively an easy task in booking his transactions; but the manufacturer who makes an engine, consisting of many hundreds of parts, of some one metal and some of another, and made by men of whom some are paid by the day and others by the piece, has a task of no mean difficulty in estimating the actual cost of a machine. We have had an opportunity of observing the system pursued in the factory to which these pages relate, and have been much struck with the elaboracy and regularity with which the transfers have been made, and the commercial accounts managed, in connexion with the symbols attached to the respective orders; the 'time' of each workman is ascertained and recorded that an error can hardly occur; and the wages and materials are so classed as to afford ready means of reference at any subsequent time. The details of the system we are unable to give into; but we may mention that the system is stated to have elapsed in bringing the system, by gradual stages, to the degree of completeness necessary for the complicated operations of the factory.
BRIGANDS.

From 1806 till 1815, or during the whole period of the French occupation of the south of Italy, brigandism raged in some parts of the States of the Church and of the Neapolitan kingdom—pure brigandism, or a brigandism mixed with patriotism, or a mortal hatred to the French conquerors. It was promoted and increased to a frightful extent by Napoleon's system of conscription, which seized upon all classes, to make soldiers of them, and to send them to fight and perish in Germany, Spain, Russia, and half the countries of Europe. Many a young man, previously of respectable condition and conduct fled to the mountains and joined the bands of irregular robbers, rather than be dragged to the army of the great and more regular robbers; others deserted at the first opportunity, and being safe from the pursuits of the gens d'armes only in the wilds and wilderesses, became of necessity fellow-denizens and co-mates with the brigands. For a long time Calabria continued to be the country most thronged with these banditti, and the portion of the south most fiercely and obstinately hostile to the French, who lost far more men there by the rifle, and the knife, and the malaria fevers, than they lost in several of their greatest campaigns and most brilliant conquests. From the first to the last they lost in the two Calabrias not fewer than twenty thousand men! The cruelties committed on both sides were atrocious.

Mr. Elmhirst, an English naval officer, who, to save himself from drowning in a sinking vessel, took refuge on the Calabrian coast, and was made a prisoner of war by the French, had a near view of what was passing in the years 1809 and 1810, and has left upon record a terrific account of all he witnessed. In the town of Monteleone he found an immense prison always filled by brigands, or by men whom the French and their partisans chose to designate as such, and a high gallows constantly at work. Fresh prisoners were continually brought in; but the daily executions prevented the prison from being too much crowded. These men were condemned, with merely a shadow of a trial, by martial law, and the executions were conducted solely by the military. They were hung up without having their shoes or hats taken off, or any covering put over their faces; and as they were turned off, they were fired at by their savage executioners, not to lessen their sufferings, but from mere spite or wantonness, for none of those Mr. Elmhirst saw were shot in a vital part, but had musket-shots through their legs, arms, &c., which would rather protract than diminish their torture. They were usually executed early in the morning, and left on the gallows, in pairs or in half-dozen, until the following morning, when they were taken down and thrown into an immense pit dug for the purpose, other victims being strung up in their places. Our worthy sailor had the curiosity to observe the process of these executions, and here are his own words:—

"In the Provinces of Calabria Ultraeore, &c., by Lieutenant P. L. Elmhirst, R.N."
and nerve to examine that horrible pit. Vast as it was, he found it filled almost to the brim with a profus­micous heap of human bodies, thrown in one upon another like dead dogs. The air within was filled with a stench, and was full of graves, which being of no depth, the bodies had been occasionally disinterred by dogs and other animals, so that the surrounding fields were overspread with human bones and the fragments of dresses. Previously to this period all the brigands or insurgents taken in the province were brought to Monleone, and shot in a pleasant picturesque valley, near the springs which supply the town with water; and were either left to rot and putrefy under the burning Cala­brian sun on the surface of the soil, or thrown into holes scarcely a foot beneath the surface. The inhabit­ants were obliged to abstain from the water which flowed from those sweet and copious springs, and to bring their supplies from a rivulet at a considerable distance. The brutalised conquerors themselves felt the inconvenience, and chose a new Golgotha. There was a second prison in the town, into which the French authorities shamefully threw the few English seamen that had run on shore to save their lives with Elmhirst, who now visited them every day to alleviate their sufferings. In one of them, what was most filthy and horrible of all, he found, crowded and stifling together, a great many of the wives and children of the peasantry, who had been suspected of favouring and carrying provisions to the brigands in the forests and mountains, and a number of respectable individuals, priests and country gentlemen, who were sentenced to death for assisting their fellow country­men, now on the other side of the Straits of Messina, princes, now in the service of the French, and whom the brutalised conquerors regarded as their accomplices and abettors. The execution of this system was intrusted to the French general Manhes, a man of iron, incapable of mercy, who took with him an army of ten thousand men, which was gradually spread over the two provinces, in towns or fortified cantonments. Manhes improved upon the system. Any peasant, without distinction of sex or age, who was found going out to labour in the country with more in his wallet than a small flask of wine and a piece of bread, calculated to be just suffi­cient to support life for one day, was taken and shot; for, having made pretty sure of the towns and villages, whence the brigands could no longer supply themselves, he thought if he only could prevent the peasantry from smuggling out provisions to them, that they must either surrender, or die of want in the mountain fastnesses to which he had driven them. If a quiet honest man concealed or corresponded with the escape of an outlaw—no matter were it his own father, or son, or brother, or bosom friend of former and happier days—he was tried over a drum and shot. If a Calabrian was found on the road, or in any other place, with a gun on his shoulder, or a knife in his girdle, and could make out anything to support life for one day, he was shot there and then. A captured and condemned brigand escaped from the cappella, or chapel, into which he had been allowed to go for confession and spiritual comfort before his execution; Manhes shot the poor priest and confessor, alleging that he must have aided the robber in his escape. If any town or village allowed the brigands a retreat sprung unawares on heedless and defenceless peasants; so that it was usual for a person, even if he had to go but half a mile from his residence, to go well armed and totake two or three armed companions with him. Few or none escaped their violence except the rural priests and the mendicant friars. If one of their own countrymen, a Calabrian, or a man from any other province of the kingdom, fell into their hands without a pigtail at the back of his head, he had no mercy to expect; for the old-fashioned pigtail was their political index by which they judged whether men were Jacobins or Bourbonists. To the heads of many who had conformed to the principles or the fashion of the day, and had cut off their queues, they sewed the tails of sheep, by way of furnishing them with the loyal appendage, and in that condition dis­missed them. "So that every man," says our honest lieutenant, "was regarded his personal safety, took care to preserve an exuberance of hair; for the more he had, or the longer his queue, so much the more was he esteemed loyal, or an enemy to the French." The brigands frequently scalped or otherwise maimed such Calabrians as had no pigtails; and at times they cut off their fingers, and compelled them to eat them as the guilt of crime. Wherever our officer went he saw bleeding heads fixed on forked sticks. He declares, of his own know­ledge, that many innocent and respectable men, in­nocent both of brigandism and of political partizanship, were executed while he was in the country. Some of the real bandits displayed a strategy which might have made them highly esteemed generals if they had been serving in the army of Napoleon; and many a time had the French cause to rue the self-confidence and contempt with which they engaged these robbers. On one occa­sion they were engaged in a general action at Longo-Bucco, one of the very wildest parts of the Calabrian Apennines, where nothing is seen but mountains rising in confused piles, and terminating in peaks; huge overhanging rocks, which threatened to crush and bury the wretched little villages beneath them; and torrents which roar from the bottom of deep and gloomy gorges. On another occasion they were driven into another deep narrow hollow, at the bottom of which stands the village of Orsomarzo, which looks as if it were placed at the bottom of a vast well; and at both these places they were nearly exter­minated, the women and children fighting with the men, or loading their rifles for them, or rolling down big stones on the heads of the French with pierc­ing shrieks and screams—"Screams," says a French officer who was engaged in both affairs, "which sounded in our ears like the shrieks of the Furies, impatiently waiting the moment when they were to feast upon our blood."* After a long service in the country, which he calls the grave and slaughter-house of Frenchmen, the French officer, by whose account we are enabled to see into the two Calabrias, and in so doing expressed his con­viction that notwithstanding all the courage, activity, and perseverance of Napoleon's troops, they were not a match for men born in the country, lightly armed, supported by a part of the population, and accustomed from their infancy to fire with a deadly aim. These brigands, who, with a needle and thread, could sew together as many as five pairs of trousers in a day, and who had been Jacobins or Bour­bonists. To the heads of a quiet honest man con­cealed or corresponded with the escape of an outlaw—no matter were it his own father, or son, or brother, or bosom friend of former and happier days—he was tried over a drum and shot. If a Calabrian was found on the road, or in any other place, with a gun on his shoulder, or a knife in his girdle, and could make out anything to support life for one day, he was shot there and then. A captured and condemned brigand escaped from the cappella, or chapel, into which he had been allowed to go for confession and spiritual comfort before his execution; Manhes shot the poor priest and confessor, alleging that he must have aided the robber in his escape. If any town or village allowed the brigands a retreat, it was visited with fire and sword, without any minute investigation as to its capability of resisting an armed band desperate as hungry tigers; and Manhes had deprived the people of their arms. Yet, after all these vigorous measures, the French found that the snake was scotched, not killed; and

* "Letters on the Calabrias," by a French officer.
though brigandism was restrained, it was not sup-
presed in the Calabrias until the spring of 1815, when
King Ferdinand was restored to his dominions. Since
that time there have been highway robberies in Cala-
bria, as in better-governed countries; but of brigandism,
properly so called, there has been little or nothing.
Between the years 1816 and 1824, ye several times
traversed great parts of those provinces, and whatever
may have been our personal inconveniences in other
matters, we had no reason to complain of the dishonesty
of the people, or to fear any attack of brigands. The
Abrużi were still more tranquil and honest. But in
Apulia and Basilicata, in the parts of the Terra di
Lavoro which touch on the States of the Church, and
within the frontiers of those States themselves, bri-
gandism continued to flourish several years longer.

DOMESTIC CONSERVATORIES FOR PLANTS.

It is always with pleasure that we notice any addition
to the stock of harmless pleasures in which the bulk
of the people can participate. The influence of those
which are of an opposite character is thus directly
weakened, and something is done towards satisfying
one of the great wants of society. Formerly the
green-house or conservatory was regarded as exclu-
sively the appendage of the stately mansion, or the
swan's nest of man, and constituted a possession
which required only to be reached and acted upon, in
order to diffuse on every side innumerable advantages
to individuals and to society. We see the love of plants
and flowers existing, apparently under the most dis-
couraging circumstances, and in spots where poverty
chores almost all the springs of wholesome pleasure.
But even there are some who

"Overhead
Suspend their crazy boxes, planted thick,
And watered duly. There the pitcher stands,
A fragment, and the spoutless tea- pot there."

It is pitiable to see these sickly objects of care in the
pent-up town, pining under the influence of the dry
atmosphere; and deep must be the inherent taste which
can persevere in resisting the obstacles to healthy
vegetation, caused by deleterious matter floating con-
stantly in the air, the excess of aridity or moisture,
excessive heat and cold, sudden alternations of tempera-
ture, and nipping blasts. Against these destructive
influences the green-house is a protection; but it is
one which is not available in large towns, especially in
London. Mr. N. B. Ward, a medical gentleman practic-
ing in the metropolis, has, however, successfully met
this difficulty, and, in accomplishing his object, he
has developed a system which is capable of most
metthis difficulty, and, in accomplishing his object, in
the remainder of their time in a state of rest.

N. B. Ward, F. L. S.

The plants grew very well, the leaves not so much
as long in an ordinary room, where, in consequence
humidity. Before the final change of the insect, a
seedling fern sprang up from the mould, of a species
which Mr. Ward had fruitlessly endeavoured to cultivate
on some rock-work in a yard at the back of his house.
The bottle was now placed outside a window with a
northern aspect, and the fern continued to flourish for
nearly four years, until accidentally destroyed during
Mr. Ward's absence from home. During this long
period the evaporation and condensation of moisture
constantly kept the mould moist. Mr. Ward soon
began to extend his experiments to plants which the
most skilful botanists had never been able to keep
alive, and which were especially intractable on account
of the occasional aridity of the atmosphere being fatal
to them. Amongst these was a beautiful cellular
plant, which is found on the rocks at Killarney and in
the laurel forests of Teneriffe. In Mr. Ward's closely-
glazed case it lived in the middle of London, enjoying
the atmosphere in which it delights.

Having satisfied himself of the success of his new
mode of growing plants, Mr. Ward extended his
experiments still farther, and at the present time has
five cases, some of them of the size of a small green-
house, in which plants of every soil and climate are
flourishing in perfect health, and as luxuriantly as in
their natural habitat, and all this has been effected in
one of the crowded parts of London. His glazed
bottle was now placed outside a window, where it had been
placed for the sake of experiment; but it has been made
an inexpensive means of gratifying a taste, which,
while it is at once refined and elegant, excites an
inquisitive spirit that raises those who are fortunate
enough to be under its influence above low and frivo-
rous pursuits. The love of the beautiful in nature,
from a pansy to a forest oak, is deeply implanted in
the human breast, and constitutes a pursuit that
requires only to be reached and acted upon, in order
to diffuse on every side innumerable advantages to
individuals and to society. We see the love of plants
and flowers existing, apparently under the most dis-
couraging circumstances, and in spots where poverty
chores almost all the springs of wholesome pleasure.
But even there are some who

* "On the Growth of Plants in closely-glazed Cases." By
N. B. Ward, F. L. S.

In the summer of 1829, Mr. Ward buried the chrys-
salis of a sphinx in some moist mould, contained in a
wide-mouthed glass bottle, covered with a lid. Watch-
ing the bottle from day to day, he observed that the
moisture which became condensed on the internal sur-
face of the glass during the heat of the day, was again
absorbed, thus keeping the mould always in a state of

* "On the Growth of Plants in closely-glazed Cases." By
N. B. Ward, F. L. S.
of the rapid evaporation, they soon droop. The principle of Mr. Ward's system is further illustrated by two of the smallest varieties of Fairy Rose. Three years ago they were planted in a tub and covered with a bell-glass, and have ever since remained outside a window facing the south. They continue in flower four or five months, and scarcely any watering is required, as this is sufficiently effected whenever rain falls, in consequence of the diameter of the glass being less than that of the tub of mould at the surface.

In common gardening we see the shadiest spot selected for certain plants, while others are exposed so as to catch the greatest degree of solar light and heat, and some are placed in situations where they are sheltered from the ungenial winds. They cannot however be entirely protected from the alternations of the temperature, and from the variability of the elements, and though many plants not perfectly acclimatised may flourish for several seasons, they are cut off at length, either by a very cold winter, unusually hot summer, late frosts, or chilling easterly winds. Others cannot be planted out of doors at all in our climate, but require the shelter of the green-house. Mr. Ward's glazed cases are still more effectual than the ordinary green-house, because they protect them from the change of the external air, by maintaining the atmosphere in a state of perfect quietness. Under this condition extremes of heat and cold may be endured which would otherwise be completely destructive of the vital principle. Intense cold is often experienced in winter when a brisk wind is blowing, although the thermometer may have reached four in the morning; and the sensation of cold was scarcely felt, in consequence of the atmosphere being undisturbed, in these instances the thermometer not being a correct indication of the sensations. This is the great principle of success in the glazed cases. Mr. Ward has had plants for three years in a window with a southern aspect, and continually exposed to a heat which, without the glass, would have withered them in a single day. The exclusion of particles of soot and other noxious matter adapts the conservatory for the town as well as the country; and we may select any spot we please, a court-yard, drawing-room, or stair-case window, or a double window, in which the cost of one of the glazed cases is scarcely felt, and the plants of tropical regions flourish in the most unpropitious spots in the heart of London. In prisons men have solaced themselves for the loss of liberty by the visits of a spider or a mouse, whose motions they have watched and studied with delight; but here is a study open to every one who enjoys the comforts of a home, which is pregnant with the most admirable results, at once gratifying the eye and informing the mind, and opening a page of the book of nature to the dweller of the city; and from its inmost recesses he may proceed, thus instructed, with an intelligent and inquiring spirit, to claim an acquaintance with the beautiful creations of vegetable life in every region of the earth.

The cost of one of the glazed cases is very trifling. The box containing the plants should be lined with zinc, and have three or four openings at the bottom for drainage; and glazed frames, well painted and putti, can be procured at about one shilling the square foot. The plants to furnish it scarcely need cost a single farthing. Mr. Ward remarks: "The common ivy grows most beautifully and can be trained over any part of the case. The primroses in early spring will abundantly repay the labour of fetching them, continuing for seven or eight weeks to flower as sweetly as in their native woods. So likewise does the wood-sorrel, the anemone, the honeysuckle, and a host of other plants, independently of numerous species of mosses and ferns. There are likewise many culti- vated plants procured at little or no cost, which grow without the slightest trouble, as the common musk-plant, myrtles, jasmines, &c. All the vacant spaces in the case may be filled with shells, sand, gravel, fossils, radishes, &c., and I think that a man would be a bad manager who could not, in the course of a twelve-month, pay for his case out of its proceeds. These remarks apply chiefly to situations where there is but little solar light. Where there is more sun, a greater number and variety of flowering plants will be found to thrive, such as several kinds of roses, passion-flowers, geraniums, &c., with numerous beautiful annuals. These cases form the most beautiful blinds, as there is not a window in London which cannot command throughout the year the most luxuriant verdure. The condensation of the moisture upon the colder surface of the glass effectually obscures the view from without, and at the same time admits far more light than is allowed to enter by ordinary blinds. Nothing can be more cheerful than the appearance of rooms thus furnished." The cases may vary in size, from that which fills the sill of a window, to one in which a diversity of heat, light, and moisture is obtained, suited to the natural condition of plants which differ widely from each other in natural growth and development of the Phallus fætidus, which shut up four inches in an hour and a half. The growth of other fungi is equally curious and interesting. Lastly, the transport of seeds and plants from one part of the globe to the other may be successfully accomplished; and the French and English governments have ordered the glazed cases to be used in all expeditions of discovery. Plants have been brought to England for the first time by this means, after every previous attempt had failed. This need scarcely be wondered at when we take into account the variations of temperature which they had to undergo. Plants, for example, leave Sydney, where the thermometer ranges at 40°, and reach England at a period perhaps when the thermometer ranges at 20°; in crossing the line rises to 120°, and finally reach England at a period perhaps when the thermometer ranges at 40°. Seeds can also be sown in the mould, and taken with still less difficulty from the tropics to any part of the temperate zone.

Mechanism of the Human Foot.—There is nothing more beautiful than the structure of the human foot, nor perhaps any demonstration which would lead a well-educated person to desire more of anatomy than that of the foot. The foot has in its structure all the fine appliances that you see in a building. In the first place, there is an arch in whatever way you regard the foot; looking down upon it we perceive several bones coming round from the astragalus, and forming an entire circle of surfaces in the contact. If we look at the profile of the foot, an arch is still manifest, of which the posterior part is formed by the heel, and the anterior by the ball and arch at the front. We find in that direction a transverse arch: so that instead of standing, as might be imagined, upon a solid bone, we stand upon an arch composed of a series of bones, which are united by the most curious provisions for the elasticity of the foot: hence, when we jump from a height direct upon the heel, a severe shock is felt; not so if we alight on the ball of the toe, for there an elasticity is found in the whole foot, and the weight of the body is thrown upon this arch, and the shock avoided.—Sir C. Bell.
THE OAK.

Of this tree more than a hundred and fifty species are enumerated, and most of them are valuable either as timber, or for their products. The species from which the best timber is derived, are, however, the common oaks, *Quercus sessiliflora* and *pedunculata*, both natives of Britain, and to them we shall chiefly confine ourselves. In point of strength, durability, and general applicability, these oaks claim the precedence of all timber; and to England, which has risen to the highest rank among the nations, mainly through her commerce and her marine, the oak, "the father of ships," as it has been called, is inferior in value only to her religion, her liberty, and the spirit and industry of her people. The oak has been an object of veneration from the earliest period: from the grove of Dodona, where

"Cynthia check'd her dragon yoke,
Gently o'er the accustom'd oak;"

contributing the oaken crowns of the Romans; forming a main feature in the worship of the Druids; the seat of justice among the Teutonic nations; and existing yet in England as boundary-marks or records of some remarkable circumstance or historical event.

A fine oak is one of the most picturesque of trees. It conveys to the mind associations of strength and duration which are very impressive. The oak stands up against the blast, and does not take, like other trees, a twisted form from the action of the winds. Except the cedar of Lebanon, no tree is so remarkable for the stoutness of its limbs; they do not exactly spring from the trunk, but divide from it; and thus it is sometimes difficult to know which is stem and which is branch. The twisted branches of the oak, too, add greatly to its beauty; and the horizontal direction of its boughs, spreading over a large surface, completes the idea of its sovereignty over all the trees of the forest. Even a decayed oak—

"—— dry and dead,
Still clad with reliques of its trophies old,
Lifting to heaven its aged, hoary head,
Whose foot on earth hath got but feeble hold—"

—even such a tree as Spenser has thus described is
strikingly beautiful: decay in this case looks pleasing. To such an oak Lucan compared Pompey in his declining state. The beauty also with which it groups, in its flourishing state, with other features, must have been recognised and will be acknowledged by all. The umbrella-leaf and even the heart of ages, mingled among the more fragile and short-lived companions of the wild forest, braving the wintry storms of untold ages, and united with their more domestic and calmer associations, where

* Hard by a cottage chimney smokes

From between that two ages,

are alike objects of unfailing interest.

Of its culture, the nature of the soils suited to it, of the uses of its timber, its bark, and its fruit, our limits would not permit us to give any satisfactory account; we therefore refer the reader to some of the many able volumes which have been written on the subject, and shall in this paper confine ourselves to a notice of some of the many remarkable English oaks, and for which we shall be indebted to Mr. Loudon’s very excellent work on the ‘Trees and Shrubs of Britain,’ he having in fact exhausted the subject; and though we were to go to the original authorities, we should even then be able to give little more, and perhaps not so well as he has already done.

In Ampthill Park, so called from a large piece of lead having been fixed on it many years ago, is remarkable for having been one of the oaks marked in a survey made of the park in the time of Cromwell, as being then old for naval timber. It is sixty-seven feet high; its trunk is thirty feet six inches in circumference; and the diameter of its head is eighty-five feet.

In Windsor Forest, there are several celebrated oaks: one of these, the King Oak, is said to have been a favourite tree of William the Conqueror, who made this a royal forest, and enacted laws for its preservation. This oak, which stands near the enclosure of Cranbourn, is twenty-six feet in circumference at three feet from the ground. It is supposed to be the largest and oldest oak in Windsor Forest, being above one thousand years old. It is quite hollow: the space within is from seven feet to eight feet in diameter, and the entrance is about four and a half feet high, and two feet wide. ‘We lunched in it,’ says Professor Burnet, ‘September 1729; it would accommodate at least twenty persons with standing room; and ten or twelve might sit down comfortably to dinner. I think, at Willis’s and in Guildhall, I have danced a quadrille in a smaller space.’ (Amen. Quer., fol. x.; and Eidodendron, pl. 29.) Queen Anne’s Oak,” says Professor Burnet, “is a tree of uncommon height and beauty, under which tradition says that Queen Anne, who often hunted in Windsor Forest, generally came to mount her horse.”

The large oak at Wotton is, probably, one of the handsomest in England. Its trunk measures twenty-five feet in circumference at one foot from the ground; and the beauty of twelve feet divides it into large limbs, the principal of which is fifteen feet in circumference. It is above ninety feet high, and covers an area of one hundred and fifty feet in diameter with its branches. The great beauty of this tree is the breadth of its head, occasioned by the enormous size of its limbs, which gives it so completely the character of the oak, that not even the most superficial observer could ever for a moment mistake it for any other tree. The Wotton Oak has all the attributes of beauty, dignity, and majesty usually given to the oak-tree: it once formed part of the ancient forest of Bern Wood, which was a favourite hunting-ground of Edward the Confessor.

* We have already given notices of Herne’s Oak, in No. 615.

‘Meavy’s Oak, on Dartmoor, is about fifty feet high; the trunk, which is twenty-seven feet in circumference, is hollow, and it has held nine persons at one time. This oak is supposed to have existed in the time of King John. The Flitton Oak stands singly on a spot where the three roads meet, on the old estate of the Earl of Morley, in the parish of North Molton. It is supposed to be a thousand years old; and, within the memory of man, it was nearly twice its present height, which is now about forty-five feet. It is thirty-three feet in circumference at about one foot from the ground; and about seven feet it divides into eight enormous limbs.

‘Not far from Blandford, Gilpin observes, there stood very lately a tree known by the name of Damer’s Oak. About five or six centuries ago, it was probably in a state of maturity. It measured sixty-eight feet in circumference at the ground, and seventeen feet above it was sixteen feet in girth. As this immense trunk decayed, it became hollow, forming a cavity fifteen feet wide and seventeen feet high, capable of holding twenty men. During the civil wars, and toll after the Restoration, this cave was inhabited by an old man, who sold ale in it. A violent storm, in 1703, greatly injured this venerable oak, and destroyed many of its nobiest limbs; however, fourteen years after, it was still so stately a tree that its top was seventy-five feet high, and extended seventy-two feet from the bole. ‘In 1735, when it was fit for nothing but fire-wood, it was sold for 14l.’

The Great Oak at Stockbridge stands on part of the estate of Robert Gordon, Esq., of Leweston, within a few yards of the turnpike-road. This oak, though it had wood there several centuries, is in perfect health, with a well-formed head. The trunk is twenty-two feet in circumference, height fifty-two feet, and diameter of the head ninety-five feet. One of the branches has been broken about ten feet from the bole, apparently many years ago; and the extremity, about twenty-five or thirty feet from the tree, now lies completely buried in the ground. The tree stands singly in a very conspicuous situation, on rising ground, and attracts the notice of travellers. At Melbury Park, there is an old oak, called Billy Wilkins, which is fifty feet high, spreads sixty feet, and has a trunk eight feet high before it breaks into branches, which is thirty feet in circumference at the smallest part. In 1725, it measured thirty-six feet round; and the short bole divided into eleven vast branches, not in the horizontal manner usual in the oak, but rather with the rise that is more generally characteristic of the beech. These branches, several of which were from ten feet to twelve feet in girth, overspread an area three hundred feet in circuit; and for many years a fair was held beneath their shade, no booth of which was allowed to extend beyond it. This celebrated festival owed its origin to the eccentricity of Daniel Day, commonly called ‘Good Day,’ who, about 1729, was wont to invite his friends to dine with him, the first Friday in July, on beans and bacon, under this venerable tree. From this circumstance becoming known, the public were attracted to the spot; and about 1725 the fair above mentioned was established, and was held for many years, on the 2nd of July in each year. Mr. Day never failed to provide annually several sacks of beans, which he distributed, with a proportionate quantity of

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DELABOLE SLATE-QUARRIES.

In a recent number we gave an account of slate-quarrying in Cornwall; we have now been favoured with a more detailed description of the working of a celebrated quarry at the extreme of the kingdom.

The Delabole quarries are situated in this parish of St. Teath, in Cornwall, about twelve miles from Bodmin. They are three in number—two of them placed in the recess of a long line of hills of very moderate height, and the third on the other side of these hills. It is to the largest and innermost of the two that our description chiefly refers.

On entering the works at the inner end of the recess (about three-fourths of a mile in depth and one-fourth wide at the outer opening) a mass of apparent rubbish first presents itself. Much of the heap is really such, and consists of the refuse of the quarry. Over this trams are laid down in various directions for convey- ing the waggons loaded with raw material raised from the pit. The unserviceable portion is for the most part brought up separately, and goes to extend and elevate this ever accumulating mass, while the slate is run off the trams to other spots to be prepared by the tram-rollers. The difference between the two sides of the ground, this heap is on a level with the entrance, and from it the sights and sounds of busy industry appear, and the ear is assailed by the reverberating crash of explosions proceeding from the pit. The waggons are seen advancing along the trams propelled by men, steam-power having previously brought them up the incline; the splitters are actively taking off the loads as brought to them, and the produce of their industry appears on all sides in long piles of roofing-slate ready for use.

From this point there is a striking view of the lower quarry, its machinery, incline, &c.; the men studied over a vast heap of debris; beyond, you look out over an undulating country, chiefly in pasture, the rough ridge of Brown Willy rising in the distance. Standing at the edge of the pit, a visitor might almost suppose himself at a railway station, from the many lines of trams, turning platforms, &c. Looking over the boarding fixed there for security, a singular spectacle appears—waggon-loads can be seen, setting off and coming back, placed in the position of trains, and the produce of their industry appears on all sides in long piles of roofing-slate ready for use.

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they are drawn by an endless chain attached to steam-machinery, an empty waggon descending a parallel incline at the same moment, and thus aiding also the ascent of the loaded one. At the top the waggon detaches itself by a simple and ingenious contrivance, and is then further propelled by hand to the splitters.

It is, of course, necessary sometimes to lower them directly down under the puppet-head; at others, to direct them to the opposite side of the pit, or to some intermediate point, just as the quarried slate may lie at the moment. This is done in the following manner:- On one of the two end-waggoners, each section of the fixed chain is fixed at the bottom of the pit, at the opposite side. It is very long, and usually hangs down, perpendicularly, the remainder of its length lying along the bottom of the pit. By the other chain the tumbril is lowered. In lowering it directly down, the fixed chain remains quiescent; but when it is wished to deposit the tumbril at any place, the sections of the fixed chain are cut more or less tightened into an inclined position by the aid of machinery on the surface; the tumbril consequently follows the fixed chain, by means of the wheel attached, and is deposited at the desired spot. Very large pieces required for any particular purpose are brought up stung in chains.

On lifting up the blade of the tumbril, the chains are fixed together, the pitmen collecting on the side opposite in perfect security.

About seven hundred tons are raised daily. The sides of the pit are not of uniform height all round. At the lowest point is a fixed ladder, by which the workman go up and down. This ladder is very high, like that of the peculiar, and has a fearful look! On the side opposite to the puppet-heads is a lift of pumps for draining the pit, work by a water-wheel above a hundred yards distant. When water fails, this wheel is moved by steam-power.

Although, for convenience sake, the works have been described as entered by the inner end of the nook in the hills, yet the most striking appearances are presented when proceeding up the recess. At the entrance a stupendous heap of debris fronts us; on the left the recess has a steep slope with a little wood on it; a lofty engine-chimney, like a round tower, rises before us; farther up we again arrive at the works of the quarry, the rubbish heap showing as a mass of blue slate, and the view being more or less in a perpendicular, and has a fearful look! On the side opposite to the puppet-heads is a lift of pumps for draining the pit, worked by a water-wheel above a hundred yards distant. When water fails, this wheel is moved by steam-power.

For exporting the produce of the quarries, there are two places on the neighbouring coast, Port Gavan, distant four miles, and Boscastle, five. Much is sent coastwise, and about twenty cargoes of roofing-slate, of eighty tons each, exported to France. The slate is conveyed to the seaside in waggons drawn partly by oxen and partly by horses. Some pyrites and quartz crystals of good water are found occasionally. In the three Delabole quarries about seven hundred people are employed, and about a hundred and forty women. The wages are good; men earning on average 15s. a week, and women 6s. These last, while at work, wear over their other dress a common waggoneer's frock, to protect it from the dust of the slate. Nearly the whole of the employment is piece-work (called tat). There are about twenty departments of work, as to their working and their conduct generally, is adopted. Various fines are inflicted for infractions. These, after paying the salary of a medical man, are bestowed in rewards to those who, during the year, have not incurred any fine. As a body the quarries are well-conducted and industrious. Potato plots are cultivated by the people, and the clearing of the encroaching land may be often seen hoeing and cleaning their crops after the hours of work are over.
NATIVES OF NOOTKA SOUND.

On the north-west Coast of North America there is a large island called the Island of Quadra and Vancouver, which is separated from the mainland on the east by a narrow channel. Nootka Sound is on the western side of the island, in nearly the fiftieth parallel of latitude. The entrance is between two rocky points three or four miles apart, and the sound gradually increases in width and extends inwards about ten miles. It contains numerous harbours, and was visited for the first time by Captain Cook in his last voyage. The name was changed by him from King George's Sound, which he had at first given it, to that of Nootka, which was the native appellation. The coast abounded with seals and sea-otters, and a few years after Cook's visit it was proposed to form an establishment here for the purpose of carrying on a trade in furs with China. In 1786 a settlement was commenced, but the Spaniards claimed a prior right to the territory, and the projected establishment was abandoned. The subject became a point for diplomatic arrangement between the Spanish and English governments, and excited the same sort of feeling which a similar question relating to the Falkland Islands had done twenty years before. The dispute was settled by a convention, in pursuance of which Nootka Sound was formally taken possession of, but after a short period we also abandoned the settlements which had been commenced, though our claim to the island as a British possession still exists. Cook states that the climate is “infinitely milder than the east coast in the same parallel of latitude.” During his stay, which was in the month of April, the thermometer at night never descended below 42°, and in the day often rose to 60°.

The natives of Nootka Sound are not an interesting people, and are greatly inferior to the other tribes inhabiting the continent. In their physical and intellectual characteristics they are more nearly allied to the Esquimaux than to the neighbouring race of red men, and are, in fact, not very much superior to the inhabitants of Tierra del Fuego. They are not ferocious or treacherous, but on the whole are a mild and good-natured people. They exhibited little or no curiosity on being first visited by Europeans, and a dull and inexpressive countenance marks their low intellectual condition. They are of short stature, with ill-proportioned limbs, and the women are scarcely distinguishable in appearance from the men. The face is round and often broad, with the cheek-bones prominent, and the eye-brows scanty and narrow. The colour of the skin in adults is of about the same complexion as that of the natives of southern Europe, and the children are nearly as fair skinned as those of England. The true colour of the skin, however, is not often seen, in consequence of their bodies being stained with a red pigment mixed with oil, the face being coloured of a brighter hue, or marked with streaks of black and white. The hair is long, black, and coarse. Ornaments of bone and metal are worn in the ear and nose. The ordinary dress consists of a mantle edged with fur at the top and fringed at the bottom, which is made out of the bark of the pine beaten into fibres. It is worn over the right shoulder, passes under the left arm, and is fastened in such a manner as to leave both arms free. Over this is a covering for the shoulders.
The houses are constructed of long broad planks, resting edge to edge, and fastened to poles by withes and chest, of the same material, with a hole in the middle, through which the wearer inserts his head. A cap, fastened by a chin-strap, and ornamented at the top by leather tassels or a round knob, is worn on the head.

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The men are chiefly engaged in hunting and fishing, and in the manufacture and repair of their nets, hooks, lines, harpoons, bows, arrows, slings, spears, canoes, and articles for household use. The largest canoes will hold above twenty persons, and the natives spend a large part of their time on the water. A curious instrument is made for taking fish when they visit the coast in shoals. It resembles an oar, and is about twenty feet long and four or five feet broad, the handle being one-third of this length. The broad part, which is twelve or thirteen feet long, is studded with sharp bone-teeth, and when struck into a shoal of fish, the men are quickly caught by and between the teeth. By far the larger proportion of their food is drawn from the sea.

The houses are constructed of long broad planks, resting edge to edge, and fastened to poles by withes and chest, of the same material, with a hole in the middle, through which the wearer inserts his head. Several families usually live in one of these habitations, a space for each being partitioned off; but the fire in the centre is used in common. A glance at the cut will convey a better idea of the interior than a written description. The boxes ranged around contain dresses and the property of each family. The household articles consist of square and oblong wooden vessels for water, baskets of twigs, bags of matting made from the pine bark, and shallow troughs about two feet long, out of which they eat their food. Implements of hunting and fishing are carelessly scattered about. Here the fish are brought in and gutted, and hung up to dry. The interior of these dwellings is no doubt correctly described by Cook, who says they are "as filthy as hog-sties, everything in and about them stinking of fish, train-oil, and smoke." The large grotesque carvings are probably only intended for ornament. Carving in wood is an art in which both skill and ingenuity are displayed; and their dwellings are made better than those of civilized people. Sometimes the whole process of the whale fishery is painted on their caps.

THE BLACK PRINCE IN SPAIN.

In the same season," says Froissart, speaking of the years 1365-6, or nine or ten years after the battle of Poitiers, "there was a king in Castile called Don Pedro, who was full of marvellous opinions. And he was rude and rebel against the commandments of holy church, and in mind to subdue all his Christian neighbours, kings, and princes. Thus does the historian introduce to us the personage known in modern times as Peter the Cruel, of Spain. Among the numerous acts which justify the claim of this sovereign to his bad pre-eminence, was the putting to death his father's mistress, and the mother of his half-brothers: this was his first kingly act on ascending the throne at the age of sixteen years, and his subsequent reign was spent in the pursuit of pleasure, wealth, and power. But if ever crime and vice brought their own full punishments, it was in Don Pedro's case, whose entire life was one continued scene of armed struggle for the crown, which he might probably have worn in comparative peace had he chosen to have been but a little less outrageous in his oppression, to have been not quite so inhume in his ferocity, and whose death was attended by circumstances more awful than any which had previously marked his career. His half-brothers were, as might have been expected after the murder of their mother, Pedro's chief opponents, the leaders of the rebellion which was so long destined to cover that beautiful country with the calamities of the worst species of war. At first they were defeated, and were obliged to emigrate into the country of Pedro, king of Arragon, "who was a good true Christian prince," and towards whom accordingly his name sake more especially bore ill-will. In 1353, by the advice of his unprincipled minister Albuquerque, Peter married Blanche of Bourbon, a princess of the royal house of France; and having done in accord-
order; and soon after Maria de Padilla also died, when a new circumstance of wonder was revealed;—she had, it appears, been his legally married wife prior to either of his public marriages. Such, at least, was the king's declaration to the Cortes which he summoned after her death (and which declared her issue by him legitimate); and several witnesses, whose fidelity does not seem to be assailable, swore to the truth of the statement.

In 1366 the man to whom all Pedro's enemies look as his successor, and their chief leader, Enrique, the eldest of the half-brothers, collected an army of thirty thousand men, chiefly consisting of those extraordinary bodies of military freebooters called the Companions, who played so conspicuous a part at different times during the middle ages. They were led, by the celebrated warrior Duguesclin and himself, across the Deed, the which he could do right well, for there was nothing to prevent him from doing so in Pedro's favour. Enrique had formed treaties with France (our old enemy, as we had reason to believe); and as they rode together, the king Don Pedro showed him the country, —a consideration of more weight with Prince Edward and the king his father, than all Pedro's faithlessness and cruelty: the result showed, however, that the old proverb contains a world of practical truth,—Honesty would have been their best policy.

"The prince, who greatly desired to see his cousin the king Don Pedro, and, to do him the more honour and feast, issued out of Bourdeaux accompanied with divers knights and squires, and went and met the king, and did to him great reverence both in word and deed, the which I shall lend you, and all that we could do right well, for there was no prince in his time that could show more honour than he. And when the prince had well feasted him, then they rode to Bourdeaux; and the prince took the king above him—in nowise he would do otherwise; and as they rode together, the king Don Pedro showed the prince how his bastard brother had chased him out of Castile: wherefore he pitied him of the untruth of his men, showing him how they had all forsaken him except one knight, the which was there with him, called Don Ferdinand de Castro. The prince right courteously and sagely comforted him, desiring him not to be abashed nor discomfited, for though he had as then lost all, he trusted it should be in the piousness of God to restore him again all his loss, and moreover to take vengeance of all his enemies. Thus, as they talked together, they rode so long that they came to Bourdeaux, and alighted at the abbey of St. Andrew, where the prince and princess kept their house. Then the prince "beheld Don Pedro," and said, "Sir, ye say well, and as for the remnant, I shall become debtor to them, and pay them as the case requireth, the which I shall lend you, and all that we need until we come into Castile." Then the prince said, "Sir, ye say well, and as for the remnant, I shall become debtor to them, and pay them as the case requireth, the which I shall lend you, and all that we need until we come into Castile." Then the prince said, "Sir, ye say well, and as for the remnant, I shall become debtor to them, and pay them as the case requireth, the which I shall lend you, and all that we need until we come into Castile." Then the prince said, "Sir, ye say well, and as for the remnant, I shall become debtor to them, and pay them as the case requireth, the which I shall lend you, and all that we need until we come into Castile."
The archbishop of the same place christened him, and the bishop of Agen, in Agenois, and the king of Majorca, were his godfathers; and this child had to name Richard, who was afterwards king of England.

The Sunday after, at the hour of prime, departed from Bordeaux the prince, with great triumph, and all other men of war.” On his way he met his brother the Duke of Lancaster, come from England to join him with a small reinforcement of men-of-arms and archers, and the English and Gascons to the amount of several thousand men from the court of the enemy he was about to attack, who were led by Sir Hugh de Calverley and Sir Robert Knowles. The army now reckoned about thirty thousand men, among whom were ten thousand of the Companions. Amidst cold and wind and snow, the prince passed through the straits and perilous passages of the Pyrenees, and in particular the valley of Roncesvalles, the scene of the great route of Charlemagne and his paladins, and so to the city of Pampeluna, where the king of Navarre made them “great cheer.” The Companions made the latter monarch repent of the free passage through his country he had promised and given; for whilst they lay about Pampeluna for three days, “they could not avoid robbing and pillaging (pillaging) that they could get.”

Enrique, or king Henry, as Froissart calls him, in the meantime excited himself to the utmost; and collected an army more numerous than the invaders, but less to be depended upon, with which he advanced to the combat that was to decide his fate. On the evening of the 2nd of April, the army of the Prince of Asturias was formed into a battle array, and in the plain between that place and Navarre, a few miles from the right bank of the Ebro. The battle did not take place till the 3rd, but an interesting incident, a kind of minor battle, marked the proceedings of this day. A large body of the Spaniards roamed about skirmishing, and obtained, from their number, several little successes; the most important is thus told by the historian:—“In the returning of the Spaniards, and approaching their own host, they encountered Sir Thomas Felton, and his brother Sir Richard Taunton, the Earl of Angus, Sir Hugh Hastings, Sir Gaylerd Vigor, and others, to the number of two hundred knights and squires, English and Gascons; and in a valley they met; and the Spaniards cried ‘Castele!’ in the name of King Henry. Then the English company seeing that great company of Spaniards, and how they could not escape from them, they comforted themselves as well as they might, and kept them together in the field, and took the advantage of a little hill. Then the Spaniards came and rested themselves before them, imagining by what means they might best fight with them. Then Sir William Felton did a great feat of arms and great outrage, for he descended down the hill with his spear in the rest, proving the goodness of his courser, and ran in among the Spaniards, and struck a knight so rudely with his spear, that the spear ran clean through him and the knight fell down dead. Then this Sir William was enclosed round about with his enemies, and there he fought as valiantly as any knight might do, and did his enemies great damage ere he was stricken to the earth. His brother Sir Thomas Felton and the other knights that were with him on the mountain, saw how he fought, and did much and in arms, and saw well what peril he was in, but they could not comfort him without losing of themselves: so they stood still in their array on the mountain; and the said knight fought still as long as he could endure, but finally there he was slain. Then the Spaniards and Frenchmen imagined how they might invade the Englishmen on the mountain. So that day there were diverse feats of arms done and achieved; for sometime part of them would descend down the mountain and fight their enemies after the event of King Henry. Thus in this estate they were till it was high noon. The prince would gladly have comforted them if he had known thereof, and delivered them out of that peril, but he was not aware thereof; therefore it believed them to abide their adventure.

When they had thus endured skirmishing a great season, Don Sancho (one of the king of Spain’s brothers), who was sore displeased that they endured so long, said a-high to his company, ‘Lords, for shame, what do we here thus all day? We ought in this time to have devoured them; advance forward, and let us fight with them with a fierce will; there is nothing will be got without it be dearly bought.’ With these words the Frenchmen and Spaniards advanced them forth with a hardy courage, and came to them so close together, that they could not be broken. So then on the mountain was done many a feat of arms; and the Englishmen and Gascons defended themselves to their powers right valiantly; but after the Spaniards were entered in among them, they could not endure any more, and the English and Gascons captured them without losing of themselves by their horses, and at night came to the prince’s host, who that day was ranged on the hill to fight.”

If the English had cared much for omens, this first incident of the struggle might have somewhat deprived their spirits and blackened their courage. But the Prince of Asturias, having calculated how many hours it would be before their companions would be relieved from their captivity.

To be continued.

Progress of Geographical Discovery in Australia.—The Sydney Herald of February 5th contains a communication from the Surveyor-General of New South Wales, Sir George Gipps, relative to the discovery of two considerable rivers in the northern part of Australia. It appears that while her Majesty’s ship “Beagle” was engaged in surveying a line of coast extending about two hundred miles in the Gulf of Carpentaria, numerous islets were discovered, and rich tracts of well-watered country, besides two important rivers, which have been respectively named the Albert and the Flinders. The Albert river takes a south-western general direction: its entrance is in 17° 36' S. lat. and 139° 49' E. long.; and it is navigable, for vessels drawing twelve feet, to a few miles from where the water is fresh. The tortuous course of the Albert was traced by the boats upwards of seventy miles, and seven miles farther on foot. Many deep watercourses and other indications of heavy rain were noticed on the journey; the appearance of the country was that of a vast plain, elevated some fifty feet, with widely scattered and rather pretty patches of woodland; the soil generally a dark rich mould. The farthest position of the river, calculated how many hours it would be before their companions would be relieved from their captivity.
THE CARP.

"The Carp," says Izaak Walton, "is the queen of rivers; a stately, a good, and a very subtle fish, that was not at first bred, nor hath been long in England, but is now naturalized." Writing in the middle of the seventeenth century, he says, that about a hundred years ago, or a few years more, there were doubtless no carp in England; and he attributes their introduction to Mr. Mascall, who lived at Plumstead, in Sussex, a county which then abounded more in this fish than any other part of the kingdom. The old couplet of Sir Richard Baker's 'Chronicle,' that

"Hops and turkeys, carp and beer,\nCame into England all in one year,"

is wholly erroneous, not only as regards carp, but the other items also. Sir Harris Nicolas, in his elaborate and beautiful edition of Walton, shows that the fish was known in England long before the period assigned. In 'The Book of St. Albans,' printed by Wynkyn de Worde, in 1436, it is said—"The carp is a deyntous fyshe: but ther ben but fewe in Englonde." The Privy-Purse Expenses of Henry VIII., for 1532, contains various entries of rewards to persons for bringing carps to the king. Most probably the carp was brought into this country some time during the fourteenth or fifteenth centuries, and no doubt for a long period it continued scarce. It was not known in Ireland until the reign of James I., and is scarce in Scotland to this day. No fish can be so easily conveyed alive from place to place. It is so tenacious of life, that in Holland it is often kept for three weeks or a month suspended in a net with wet moss, and fed with bread steeped in milk; care being taken to refresh the fish now and then by pouring water on the moss.

The hauntsof the carp in summer are in deep holes, under roots of trees, and hollows of banks, or amidst weeds and flags. In winter they bury themselves in the mud in the quietest parts of the river. The spawning-time is at the end of May or beginning of June. It is stated on the authority of two German naturalists that in the roe of a female weighing six pounds the number of ova was six hundred thousand; and in another, weighing ten pounds, there were seven hundred thousand. It is well known that the carp is exceedingly prolific. The usual size which the fish attains in English rivers is from twelve to fifteen or sixteen inches. Walton had never seen one exceeding twenty-three inches in length, but knew that they were found of a larger size. A light, loamy, or gravelly bottom is favourable to their increase, both in numbers and size, as it furnishes in sufficient abundance the vegetable matter, worms, and larvæ on which they feed. The carp does not breed freely in Scotland, and is scarcely known in Russia. It thrives best in the central and southern parts of Europe. M. Boccius, the author of a recent work 'On the Management of Fresh-water Fish, with a View to making Them a Source of Profit to Landed Proprietors,' mentions two breeding carp taken from a friend's pond in Saxony, which were of the respective weights of fifty-two and fifty-three Saxon pounds, or fifty-six and fifty-seven pounds English. A stuffed carp, three feet four inches long, which was taken from Antwerp or the neighbourhood, may be seen at the present time at a fishmonger's in Leadenhall-market. Mr. Yarrell states that carp attain a weight of three pounds by their sixth
year, and of six pounds before their tenth year. M. Boccius gives an account somewhat different. In the autumn of their third year, he says, they weigh from three to four pounds; and in their sixth year they attain from eight to ten pounds; and afterwards increase at the rate of a pound and a quarter and a pound and a half a year until they reach the ordinary weight of thirty pounds. In these statements M. Boccius is speaking of the fish-ponds in Saxony, where circumstances are peculiarly favourable to the carp; instead of being shy and cautious, like those which are not provided with an artificial supply of food, the carp becomes bold and familiar; and besides, the species kept in these ponds (the Spiegel, or Mirror-carp) differs from the kind found in England. It has beautiful blue-mottled scales, and is altogether superior for the purpose of artificial breeding. M. Boccius has introduced this species into the fish-ponds of Sir Robert Adair, in Norfolk.

The carp is in season from October to April. Those which are more than twenty years old are "hideously coarse," according to the account of M. Boccius, and are fit only for breeding. Carp are prolific in proportion to their age. One weighing ten pounds is in probable. Mr. Boccius is of opinion that carp is much indebted to cooks for the estimation in which it is held; and the recipe given by Izaak Walton for cooking this fish confirms the opinion. Sweet marjoram, thyme, parsley, rosemary, and savory, are to be put to "your carp," with four or five whole onions, a score of picked oysters, and two or three anchovies; lively and graceful movements and beautiful hues to be put to your carp, "with four or five whole onions, they are kept in houses in a similar manner. The carp in the ponds at Charlottenberg, a seat of the king of Prussia, are summoned to feed by a bell.

The gold carp is the species kept in glass bowls in rooms, and was introduced into this country, about the end of the seventeenth century, from China, where they are kept in houses in a similar manner. Their lively and graceful movements and beautiful hues make them very pleasing. The carp has become naturalized in this country, and breeds in ponds which are warm and sheltered, especially in those where the temperature is raised by the discharge of warm water from steam-engines. They abound also in many of the streams in Portugal, from whence they are brought for sale to England. When young they are of a dark and almost black colour, the golden red hue appearing as they become older.

HAMBURGH.—THE GREAT FIRE.

On Thursday, the 5th May, 1842, about one o'clock in the morning, a fire broke out in a narrow and obscure part of Hamburgh. This was at the end of a narrow street called the Deer Street, and had not previously been noticed by any of the inhabitants of the street, except by a watchman who was on duty. The fire spread rapidly, and within a short time the whole street was in flames. The houses were quickly on the spot, but did not succeed in stopping the progress of the flames. In the upper part of the house in which the fire originated a quantity of rags were stored, and although at the time when it burst forth there was little wind stirring, the combustible nature of these materials and the large proportion of timber used in the construction of the neighbouring houses in that narrow street rendered them an easy prey to the flames. Eight or nine hours after the commencement of the fire, it was mentioned in distant parts of the city, which the conflagration afterwards reached, that a large fire was raging in the neighbourhood of the Deich Strasse; but this news, detailed as it was, excited only that general sentiment of regret which persons who are not likely to be themselves sufferers are apt to entertain on such occasions. The householders of Pall-Mall fear not for himself when a fire occurs at Temple Bar, and yet a space as extensive as this was finally comprehended in the same devastation at Hamburgh. This indifference was soon changed into consternation as accounts were successively circulated respecting the extent of the fire; though still many who lived in parts which were yet distant from its ravages felt themselves secure; and sympathy for the loss of property and the distresses of others was the only thing which these reports called forth. But the fire continued to rage wildly and fiercely, and at length there
was not an inhabitant of Hamburgh who did not tremble with apprehension at its awful progress, as it swept from street to street, across the canals and market-places, enveloping churches, the public buildings of the city, warehouses with their stores of coffee, sugar, tobacco, corn, and other merchandise, the lighter in the canal ready to discharge its cargo, shops, dwelling-houses, and all in one common ruin. The wind had changed into a violent gale, and gave wings to the burning embers which rose from the cracking timbers as the roof-tree and crumbling walls yielded to the fury of the conflagration. The following letter, written by a young lady on the spot, gives so excellent a general view of the progress of the fire, and the circumstances which marked its successive stages, that we are induced to transcribe it in preference to compiling our account from a variety of sources. The letter is dated on the 9th of May:—

"On Thursday morning (says the writer), Ascension-day, the 8th instant, my sister, her husband, and I walked to the French church. Frederick, on taking a seat in the coach, informed me that o'clock a terrible fire had been raging in the Deich Strasse. Papa, who knows the distance between the Neuer Jungfernstieg and the Deich Strasse, will agree that we had no cause for alarm. In coming out of church the servant told us to Madame Parish (who, you are aware, lives in the country, and had come thence that morning direct), that she had heard of the conflagration. After a short walk that twenty-two houses had already been totally burned—that, in fact, hers was in great danger, and that the fire was becoming more and more formidable. A few hours afterwards came the news that the house of Mr. Parish was no more, and that the flames were spreading every instant. Towards four o'clock in the afternoon, Frederick, who, with the object of saving the church of St. Nicholas's church, had already seen the destruction of St. Peter's church. It was terrible to see this beautiful building become the prey of the element, which was becoming more fearful the more ground it gained. My sister and her husband were to have gone to the Opera in the evening, but it was announced that in consequence of the calamity there would be no performance. The spectacle became from hour to hour more shocking. The whole city now began to show the most lively alarm. The bells, the firing of cannon, the cries and confusion in the streets, all presaged a night of anguish and terror. Our apprehensions, alas! were but too faithfully realized. It was not, however, till night had spread its arms over the city and of that we became aware, that we perceived the whole extent of the destruction which menaced the entire city. The heavens became as red as blood—the devouring flames, increased more and more by an impetuous wind, rose to a gigantic height. At seven o'clock Madame —— came to us in a wretched state. She told us that her sisters at Holzdamm (who were farther from the fire than we, the flames having taken the direction of Dreck Wall and Bleichen) had sent all their valuables to her, so great was the fear they were in. We could hardly avoid smiling; for we thought it incredible that the fire could possibly reach Holzdamm. At ten, Madame —— went home, and my sister retired to bed towards eleven, but afterwards we received a visit from some gentlemen, who came to say that serious measures were about to be taken, by blowing up some houses which were likely to cause the fire to spread farther. At half-past twelve, I went to bed myself; but the noise of the explosions, the rumbling of the carriages and carts, the cries, the large flakes of fire which every instant were driven into the windows, and the strong wind were sufficient to set fire to our house, the excessive light of the conflagration, the whistling of the wind, and, as you will easily think, the idea that the lives of persons in whom we were interested were in continual danger, not to mention the conviction of the numberless misfortunes that were happening, prevented all sleep. The windows trembled with the redoubled conusions of the explosions, and the whole house seemed as if it would be annihilated. In such a state I could not close an eye; visions and dreams, but, above all, still sadder realities presented themselves to my imagination continually. Before three o'clock had struck, I found myself again with my sister, who, like me, had been kept awake by the dreadful noise caused by the blowing up of the Rathaus. At this moment an order of the police was announced to us to wet the roof of our house, and to cause the water to flow in the gutters. Frederick had flown to the assistance of his brothers. We were therefore alone, and mounting on the roof, scarcely dressed, were soon throwing over it pails of water, and our neighbours were doing the same. We prepared ourselves for the worst—threw on our clothes: the confusion increased—we could not remain. We packed up in sheetlets and in boxes some of our effects. With the appearance of eight or ten fire-engines, the spectacle became as sublime as it was fearful to view the sun, clear and brilliant, rising in all its splendour over the Lombard's bridge, and on the city side to see nothing but a single mass of flames. It was not, however, a moment for contemplation, but for action; for the worst was to come. We called for the coachman to come. We had passed the things which he was to take with him, and it was impossible to carry away any more. Whole families fell down and fainted before our doors. We could hardly avoid smirking; for we we obtained carts and horsesto transport our goods; with our own hands we helped to extinguish the flames. A woman was on fire before our house. With our own hands we helped to extinguish the flames. A woman was on fire before our house. The firemen were reposing on them."

THE PENNY MAGAZINE.
fire, between the eastern and western extremities of the above line. The Fire of London, an account of which will be found in No. 91 of this work, lasted for about the same period as that at Hamburg, extending from the Monument to Temple Bar, and raging over an irregular line from half a mile to two thirds of a mile northward of the river. In this space, comprising four hundred streets, lanes, and courts, there was destroyed eighty-six parish churches, six chapels, the cathedral church of St. Paul's, thirteen thousand and two hundred houses, the Guildhall, Royal Exchange, Custom-House, fifty-two of the halls of city companies, and a number of other important edifices; three of the city gates, four stone bridges, and four prisons, including Newgate. The total loss was estimated at about six or seven millions stirling. London was then rather more than four times larger than Hamburg is now. During the progress of the fire of 1666, the mob, rendered stupefied and desperate by the horrors which surrounded them, seized upon all foreigners and English Catholics as their fury arched over the land, and shed the blood of many innocent persons. An insane Frenchman accused himself of having been in a plot with two other poor Frenchmen, and he stated that they had set fire to the first house; but although the judges plainly intimated that no reliance could be placed on his evidence, in consequence of the state of his intellect, he was unhappily executed. The means of preventing such excesses, though public order was for a time suspended.

Proper Time for Cutting Hay and other Crops.—The period at which hay is cut, is materially as the quality (by weight) and quality of the produce. It is commonly known that when radishes are left too long in the ground they become hard and woody—that the soft turnip system of the young calabar undergoes a similar change as the plant grows old—and that the same becomes tough and unpalatable when cut. The more completely the latter change is effectuated—that is, the riper the plant becomes, the less sugar and starch, both soluble substances, they contain. And though it has been ascertained that the woody fibre is not wholly indigestible, but that the cow, for example, can approximate it and pass it as part of its food, yet the reader will readily imagine that those parts of the food which consist chiefly of easily are also likely—other things being equal—to be most nourishing to the animal. It is ascertained also that the weight of hay or straw reaped is actually less when the crop is left to become old and hard than when it is cut after the plant has attained its greatest height, a larger quantity as well as a better quality of hay will be obtained, while the land also will be less exhausted. The same remarks apply to crops of corn, both to the straw and to grain they yield. The riper the crop is cut, the heavier and more nourishing the straw. Within three weeks of being fully ripe, the straw begins to diminish in weight, and the longer it remains uncut after that time the lighter it becomes and the less nourishing. On the other hand, the ear, which is soft and moist while it is ripe, gradually consolidates, the sugar changing into starch, and the milk thickening into the gluten and albumen of the flour. As soon as this change is nearly completed, or about a fortnight before ripening, the grain contains the largest proportion of starch and gluten; if reaped at this time the bud will be heavier, and will yield the largest quantity of fine flour and the least bran. At this period the grain has a thin skin, and hence the small quantity of bran. But if the crop be still left uncut, the next step in the ripening process is a softening of the skin, a better protection, a thicker skin. A portion of the starch of the grain is changed into woody fibre, precisely as in the ripening of hay, of the soft shoots of the dog-rose, and of the roots of the common rush. By this change the quantity of starch is diminished, and the weight of the individual particles yield of flour, and the increased produce of bran.
BIRTH-PLACE OF SHAKSPERE.

[From 'Shakspere: a Biography.' By C. Knight.]

This parish of Stratford was unquestionably the birthplace of William Shakspere. But in what part of Stratford dwelt his parents in the year 1564? It was ten years after this that his father became the purchaser of two freehold houses in Henley Street—houses which still exist. Nine years before William Shakspere was born, his father had also purchased two copyhold tenements in Stratford—one in Greenhill Street, one in Henley Street. The copyhold house in Henley Street, purchased in 1555, was unquestionably not one of the freehold houses in the same street purchased in 1574; yet, from Malone's loose way of stating that in 1555 the lease of a house in Henley Street was assigned to John Shakspere, it has been conjectured that he purchased in 1574 the house he had occupied for many years.* As he purchased two

* It is marvellous that Malone, with the documents before him, which are clearly the admissions of John Shakspere to two copyhold estates, should say:—"At the court-leet, held in October, 1556, the lease of a house in Greenhill Street was assigned to Mr. John Shakspere, by George Turnor, who was one of the burgesses of Stratford, and kept a tavern or victualling-house there; and another, in Henley Street, was, on the same day, assigned to him, by Edward West, a person of some consideration, who during the reign of Edward VI. had been frequently one of the wardens of the bridge of Stratford." It is equally wonderful that, Malone having printed the documents, no one who writes about Shakspere has deduced from them that Shakspere's father was necessarily a person of some substance before his marriage, a purchaser of property. The roll says—"Et idem Jobes pd. in cur. fecit dito fidelitatem p' eisdem," that is, "And the said John in the aforesaid court did fealty to the lord for the same." Every one knows that this is the mode of admission to a copyhold estate in fee simple, and yet Malone writes as if these forms were gone through to enable John Shakspere to occupy two houses in two distinct streets, under lease. We subjoin a translation of this entry upon the court-roll:—

"Stratford upon Avon. View of Frankpledge with the court and session of the peace held of the same on the second day of October in the year of the reign of Philip and Mary, by the grace of God, &c., the third and fourth.

"Item, they present that George Turnor has alienated to John Shakspere and his heirs one tenement with a garden andcroft, with their appurtenances, in Greenhill Street, held of the lord, and delivered according to the roll, for the rent from thence to the lord of sixpence per annum, and suit of court, and the houses in 1555 in different parts of the town, it is not likely that he occupied both; he might not have occupied either. Before he purchased the two houses in Henley Street, in 1574, he occupied fourteen acres of meadow-land, with appurtenances, at a very high rent; the property is called Ingon meadow in "the Close Rolls." Dugdale calls the place where it was situated "Inge;" saying that it was a member of the manor of Old Stratford, "and signifies in our old English a meadow or low ground, the name well agreeing with its situation." It is about a mile and a quarter from the town of Stratford, on the road to Warwick. William Shakspere, then, might have been born at either of his father's copyhold houses, in Greenhill Street, or in Henley Street; he might have been born at Ingon; or his father might have occupied one of the two freehold houses in Henley Street at the time of the birth of his eldest son. Tradition says that William Shakspere was born in one of these houses; tradition points out the very room in which he was born. Let us not disturb the belief. To look upon that ancient house—perhaps now one of the oldest in Stratford—pilgrims have come from every region where the name of Shakspere is known. The property passed into a younger branch of the Shakspere family; the descendants of that branch grew poorer and poorer; they sold off its orchards and gardens; they divided and subdivided it into smaller tenements; it became partly a butcher's shop, partly a little inn. The external appearance was greatly altered, and its humble front rendered still humbler. The windows in the roof were removed; and the half which had become the inn received a new brick casing. The central portion is that which is now shown as the birthplace of the illustrious man—"the myriad-minded"—he whose memory almost hushes the breathings even of the merely curious, who look upon that mean room, with its massive joists and plastered walls, firm with ribs of oak, where we are told the poet of the human race was born. Hundreds amongst the hundreds of said John in the aforesaid court did fealty to the lord for the same.

"Item, that Edward West has alienated to him, the aforesaid John Shakspere, one tenement, with a garden adjacent, in Henley Street, for the rent from thence to the lord of sixpence per annum, and suit of court, and the said John in the aforesaid court did fealty."
If the belief that the property was the home of his boyhood. It was purchased by John Shakspere from Edmund Hall and Emma his wife, for forty pounds. In a copy of the chirop- graph of the fine leaved on this occasion (which is now in the possession of Mr. Wheler, of Stratford) the property is described as a toft of land, two messuages, two gardens, and two orchards with their appurtenances. The property does not define the situation of the property, beyond its being in Stratford-upon-Avon; but in the deed of sale of another property, in 1591, that property is described as situate between the houses of Robert Johnson and John Shakspere; and in 1597 John Shakspere himself sells a “toft, or parcel of land,” in Henley Street, with the tenement adjoining; for the other house was known as the Maidenhead in 1542. In another part of Shakspere’s will he bequeaths, amongst the bulk of his property, to his eldest daughter, Susanna Hall, with remainder to her male issue, “two messuages or tenements, with the appurtenances, situate, lying, and being in Henley Street, within the borough of Stratford.” There are existing settlements of this very property in the family of Shakspere’s eldest daughter and granddaughter; and this granddaughter, Elizabeth Nash, who was married a second time to Sir John Barnard, left both houses, namely, “the inn called the Maidenhead, and the adjoining house and barn,” to her kinsmen Thomas and George Hart, the grandsons of her grandfather’s “sister Joan.” Thus it descended to the last alleged descendant of the family of Shakespeare, and the property remained until the beginning of the present century. But it was gradually diminished. The orchards and gardens were originally extensive: a century ago tenements had been built upon them, and they were alienated by the Hart then in possession. The Maidenhead Inn became the Swan Inn, and is now the Swan and Maidenhead. The White Lion, on the other side of the property, extended his lair so as to include the remaining orchards and gardens. The house in which Mrs. Hart had lived so long became divided into two tenements; and at the end of the last century the lower part of one was a butcher’s shop, which, according to the Aubrey tradition, some persons believed to have been the original shop where John Shakspere pursued his calf-killing vocation with the aid of his illustrious son. Mr. Wheler, in a very interesting account of these premises, and their mutations, published in 1824, tells us that the butcher-occupant, some thirty years ago, having an eye to every gainful attraction, wrote up,

“THE IMMORTAL SHAKESPEARE WAS BORN IN THIS HOUSE.”

N.B.—A HORSE AND TAXED CART TO LET.

It is not now used as a butcher’s shop, but there are the arrangements for a butcher’s trade in the lower room—the cross-beams with hooks, and the window-board for joints. We are now told by a sign-board,

“THE IMMORTAL SHAKESPEARE WAS BORN IN THIS HOUSE.”

Twenty years ago, when we made our first pilgrimage to Stratford, the house had gone out of the family of the Harts, and the last alleged descendant was recently ejected. It had been a gainful trade to her for some years to show the old kitchen behind the shop, and the honoured bedroom. When the poor old woman, the last of the Harts, had to quit her vocation (she claimed to have inherited some of the family’s genius), the possession of her great ancestor, for she had produced a marvellous poem on the Battle of Waterloo, she set up a rival shop—on the other side of the street, filled with all sorts of trumpery relics pretended to have belonged to Shakspere. But she was in ill humour. In a fit of resentment, the day before she quitted the ancient house, she went to the window of the house in which Mrs. Hart had lived so long, and threw some plaster into the room, so as to obliterate the pencil inscriptions with which they were covered. It has been the work of her successor to remove the plaster; and manifold names, obscure or renowned, again see the light. The house has a few ancient articles of furniture about it; but there is nothing which can be considered as original belonging to it as the home of William Shakspere.

ERUPTION OF THE VOLCANO OF KILAUEA,
IN THE ISLAND OF HAWAII (OWHYEE)

[From the ‘Report of the American Board of Foreign Missions.’]

On the 30th of May, 1840, the people of Puna observed the appearance of smoke and fire in a mountainous and desolate region in the interior of that district. Thinking that the fire might be the burning of some jungle, they took little notice of it until the next day, when the meetings in the different villages were thrown into confusion by sudden and grand exhibitions of fire, on a scale so large and fearful as to leave them no room to doubt the cause of the phenomenon. The fire augmented during the day and night; but it did not seem to flow off rapidly in any direction. All were in consternation, as it was expected that the molten flood would pour itself down from its height of four thousand feet to the coast, and no one knew to what point it would flow, or what might be its termination. On the 31st of May, a considerable amount of fire rushed over the plain, and an encampment was thrown up. On the 1st of June, the stream began to flow off in a north-easterly direction, and on the following Wednesday, June 3rd, at evening, the burning river reached the sea, having averaged about half a mile an hour in its progress. The rapidity of the flow was very unequal, being modified by the inequalities of the surface over which the stream passed. Sometimes it is supposed to have moved five miles an hour, and at other times, owing to obstructions, making no apparent progress, except in filling up deep valleys, and in swelling over or breaking away hills and precipices.

But I will return to the source of the irruption. This is in a forest, and in the bottom of an ancient wooded crater, about four hundred feet deep, and probably eight miles east from Kilauea. The region
being uninhabited and covered with a thicket, it was some time before the place was discovered, and the natives of foreign countries who attempted it, no one except myself has reached the spot. From Kilauea to this place the lava flows in a subterranean gallery, probably at the depth of a thousand feet, but its course can be distinctly traced all the way, by the rending of the crust of the earth into innumerable fissures, and by the emission of smoke, steam, and gas, in ample quantities. The eruption is small, and from this place the stream disappears again for the distance of a mile or two, when the lava again rushes up and spreads over an area of about fifty acres. Again it passes underground for two or three miles, when it reappears in another old wooded crater, consuming the forest, and partly filling up the basin. Once more it disappeared in a subterranean channel, cracks and breaks the earth, opening fissures from six inches to ten or twelve feet in width, and sometimes splitting the trunk of a tree so exactly that its legs stand astride at the fissure. At some places it is impossible to trace the subterranean stream, on account of the impenetrable thicket under which it passes. After flowing underground several miles, it escaped from five to six, or eight or nine feet, overflowing flood water, and sweeping forest, hamlet, plantation, and everything before it, rolled down with resistless energy to the sea, where leaping a precipice of forty or fifty feet, it poured itself in one vast cataract of fire into the deep below, with loud detonations, fearful hissings, and a thousand uncanny and indescribable effects. Imagine to yourself a river of fused minerals, of the breadth and depth of the Niagara, and of a deep gory red, falling, in one embazoned sheet, one raging torrent, into the ocean! The scene, as described by eye-witnesses, was terribly sublime. Two mighty agencies in collision! Two antagonistic and gigantic forces in contact, and producing effects be longing to this and the preceding chapter, will be found in the last number of the Magazine.

During the progress of this eruption, the great crater of Kilauea sunk about three hundred feet, and her fires became nearly extinct, one lake only out of many being left active in this mighty caldron. This, with other facts which have been named, demonstrates that the eruption was the disgorgement of the fires of Kilauea. The open lake in the old crater is at present intensely active, and the fires are increasing, as is evident from the glare visible at our station and from the testimony of visitors.

During the early part of the eruption, alight and momentary shocks of earthquake, were felt, for several successive days, near the scene of action. These shocks were not noticed at Hilo.

I will just remark here, that while the stream was flowing, it might be approached within a few yards on the windward side, while at the leeward no one could live within the distance of many miles, on account of the smoke, the impregnation of the atmosphere with pungent and deadly gases, and the fiery showers which were constantly descending, and destroying all vegetable life. During the progress of the descending stream, it would often fall into some fissure, and forcing itself into apertures and under massy rocks, and even hillocks and extended plates of ground, and lifting them off from their ancient beds, bear them whirling like a spinning wheel, through innumerable fissures, and by the emission of mights mouldering mass, I was more and more impressed at every step with the wonderful spectacle. Hills had been melted down, like wax; ravines and deep valleys had been filled; and majestic forests had disappeared like a feather in the flames. In some places the molten stream parted and flowed in separate channels for a considerable distance, and then uniting, formed islands of various sizes, from one to fifty acres, with trees still standing, but seared and blighted by the intense heat. On the outer edges of the lava, where the stream was more shallow and the heat less vehement, and where of course the liquid mass cooled soonest, the trees were mowed down like grass before the scythe, and left charred, crisped, smouldering, and only half consumed.

As the lava flowed around the trunks of large trees on the windward side, the molten stream broke on like an overwhelming flood, and sweeping forest, hamlet, and everything before it. While the burning lava, as it fell into the water, was shivered into millions of minute particles, and, being thrown back into the air, fell in showers of sand on all the surrounding country. The coast was extended into the sea for a quarter of a mile, and a pretty sand-beach and are formed in the sea, the lowest about two hundred feet, and the highest about three hundred.

For three weeks this terrific river disgorged itself into the sea with little abatement. Multitudes of fish were killed, and the waters of the ocean were heated for twenty miles along the coast. The breadth of the stream where it fell into the sea is about half a mile, but inland it varies from one to four or five miles in width, conforming itself, like a river, to the face of the country over which it flowed. Indeed, if you can imagine the Mississippi converted into liquid fire of the consistency of fused iron, and moving onward, sometimes rapidly, sometimes sluggish, now widening into a sea, and anon rushing through a narrow defile, winding its way through mighty forests and ancient solitudes, you will get some idea of the spectacle here exhibited. The depth of the stream will probably vary from ten to two hundred feet, according to the inequalities of the surface over which it passed. During the flow, might was converted into day on all the elevated parts of the country, and on the mountains, and its glare was seen on the opposite side of the island. It was also distinctly visible for more than one hundred miles at sea; and at the distance of forty miles fine print could be read at midnight. The brilliancy of the light was like a blazing firmament, and the scene is said to have been one of unrivalled sublimity.

The whole course of the stream from Kilauea to the sea is about forty miles. Its mouth is about twenty-five miles from the place of beginning. The ground over which it flowed descends at the rate of one hundred feet to the mile. The crust is now cooled, and may be traversed with care, though scaling steam, pungent gases, and smoke are still emitted in many places.

In pursuing my way for nearly two days over this mighty smouldering mass, I was more and more impressed at every step with the wonderful spectacle. Hills had been melted down, like wax; ravines and deep valleys had been filled; and majestic forests had disappeared like a feather in the flames. In some places the molten stream parted and flowed in separate channels for a considerable distance, and then uniting, formed islands of various sizes, from one to fifty acres, with trees still standing, but seared and blighted by the intense heat. On the outer edges of the lava, where the stream was more shallow and the heat less vehement, and where of course the liquid mass cooled soonest, the trees were mowed down like grass before the scythe, and left charred, crisped, smouldering, and only half consumed.

As the lava flowed around the trunks of large trees on the windward side, the molten stream broke on like an overflowing flood, and sweeping forest, hamlet, and everything before it. While the burning lava, as it fell into the water, was shivered into millions of minute particles, and, being thrown back into the air, fell in showers of sand on all the surrounding country. The coast was extended into the sea for a quarter of a mile, and a pretty sand-beach and are formed in the sea, the lowest about two hundred feet, and the highest about three hundred.

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main stream, and intensely gazing on the absorbing scene before him, found himself suddenly raised to the height of ten or fifteen feet above the common level around him, and had not time to escape from his dangerous position, when the earth opened where he had stood, and a stream of fire gushed out.

No lives were lost, and but little property was destroyed, as the stream of lava chiefly passed over an almost uninhabited desert.

Wood Rafts.—The quantity of wood that is brought down by the little river Enz is immense, and must be seen to be believed. They raise the water by little sluices until it is high enough to float the trees; which are first peeled, and then tied together with a sort of rope made of small fir-trees, which is quite a trade in the upper part of the forest. The smallest trees are placed first, to make the raft narrower in front; three men with long leather boots much above their knees stand upon the fore-part, and with their long poles guide it: they are up to their ankles in water, their extra clothes hang upon a nail on the raft, and so they go down to the Rhine, shooting every fall, turning every angle with skill, and in the greatest ease; they come up with the great monsters on that river. Some of the trees are sixty yards long; I measured one eighty; and we have counted eighteen of these lengths. When they wish to stop it, they run one of the middle lengths against the bank, and they soon become a van with the fire-wood, which is split and cut into lengths of three feet, goes down in part of itself, as if it knew its own business, and, like a good and faithful servant, would perform it. But the idle and dilatory stop on the way; these attract others, (it is wonderful how catching idle things are,) until at last the river is fringed with them the whole way. After leaving them many days to their cogitations, men come with large poles and sharp hooks, and soon send them down after their brethren.—Lady Lavover's Last Tour and First Work.

Indian Fortress.—We did not reach the rock until the afternoon of the next day, and upon my arrival I found that a good house at its foot, in which some of the Raja's family usually resided, had been emptied for my reception. I followed the Raja up the stairs, or rather steps, to the upper room, where one of his attendants immediately presented me with a plate of small, thin, fancifully stamped pieces of gold, made from the gold-dust collected at the banks of the Indus and other rivers in the country, and another plateful of similar silver pieces, which I showered down from the balcony upon the crowd below. After that was exhausted, we threw down several bits of cloth for tunics, &c., and we all laughed heartily at the furious vociferations and scrambling that took place, even before they had descended. The Indus was visible from my window, and I then turned to enjoy the view of it for the first time. It approached through a sandy plain, from the eastern end of the valley, and here, nine miles from the entrance, it washed the end of the rock within musket-shot of me, in a narrow stream of more than one hundred and fifty yards in width. The rock, or killah, at it is called, is about two miles in length, and the peak over the east end rises about eight hundred feet above the river. The whole of this superb natural fortress, situated in the middle of the valley of Iskardo, which is nineteen miles long and seven in width, rises above, in most places, mural sides, from a buttress of sand, loose stones, and broken rocks, excepting at the western end, where it slopes, but steeply, on to the plain; and on the north it is washed by the deep and rapid torrent of the mighty Indus. The Gylo's castle is built upon a small flat about three hundred feet above the river. A wooden mosque and state prison form part of the building. The castle itself is of stone, with wooden frameworks, and is strongly fortified against musketry. The zigzag by which it is approached is also divided by gateways and wooden towers. Defences of the same kind are built on different parts of the rock. There is a look-out house on a peak a little above the castle, and another on the summit above that. In my humble judgment it could be made as strong a place as Gibraltar, which, in general configuration, it would much resemble, were the east and west end of the killah to change places.—Travels in Kashmir, Ladakh, Iskardo, &c., by G. T. Payne.
RAILWAY RAMBLES.

BURNHAM BEECHES.

With five and twenty miles of Saint Paul’s, the Great Western Railway will place us in an hour, (having an additional walk of about two miles) in the heart of one of the most secluded districts in England. We know nothing of forest scenery equal to Burnham Beeches. There are no spots approaching to it in wild grandeur to be found in Windsor Forest; Sherwood, we have been told, has trees as ancient, but few so entirely untouched in modern times. When at the village of Burnham, which is about a mile and a half from the railway station at Maidenhead, the beeches may be reached by several roads, each very beautiful in its seclusion. We ascend a hill, and find a sort of table-land forming a rude common with a few scattered houses. Gradually the common grows less open. We see large masses of wood in clumps, and now and then a gigantic tree close by the road. The trunks of these scattered trees are of amazing size. They are for the most part pollards; but not having been lopped for very many years, they have thrown out mighty arms, which give us a notion of some deformed son of Anak, noble as well as fearful in his grotesque proportions. As we advance the wood thickens; and as the road leads us into a deep dell, we are at length completely embosomed in a leafy wilderness. This dell is a most romantic spot. It extends for some quarter of a mile between overhanging banks covered with the graceful forms of the ash and the birch; while the contorted beeches show their fantastic roots and unwieldy trunks upon the edge of the glen, in singular contrast. If we walk up this valley we may emerge into the plain of beeches from which the place derives its name. It is not easy to make scenes such as these interesting in description. The great charm of this spot may be readily conceived when it is known that its characteristic is an entire absence of human care. The property has been carefully preserved in its ancient state, and the axe of the woodman for many a day has not been heard within its precincts. The sheep wander through the tender grass as if they were the rightful lords of the domain. We asked a solitary old man who was sitting on a stump, whether there was any account who planted this ancient wood: "Planted!" he replied; "it was never planted: those trees are as old as the world." However sceptical we might be as to the poor man’s chronology, we were sure that history or tradition could tell little about their planting.

The road through Burnham Beeches conducts to Dropmore, the residence of the late estimable Lord Grenville. Here, retired from statesmanship, this tasteful nobleman in a few years covered a barren common with luxuriant woodlands and exquisite gardens. We are thus, at Dropmore, able to see what art and industry can do rapidly; whilst in Burnham Beeches we behold the majesty of unassisted nature, in its slow and silent working. A short walk leads to Dropmore, which is shown to all persons applying for permission to see it. We shall describe it in a future Number.

SWANS AND SWAN-UPPING.

In England the Swan is said to be a bird royal, in which no subject can have property, when at large in a public river or creek, except by grant from the crown. In creating this privilege the crown grants a swan-mark (cygnumata), for a game of swans, called in law Latin deductus (a pastime, un déduit) cygnumum,
In the reign of Elizabeth, upwards of nine hundred corporations and individuals had their distinct swan-marks, one of which we give from Yarrell's 'British Birds,' vol. iii., 121, &c. It is the royal swan-mark used in the three last reigns and the present, from the cut given by Mr. Yarrell, in whose interesting 'British Birds' much curious information on this subject, together with no less than sixteen swan-marks, will be found.

Sometimes, though rarely, the crown, instead of granting a swan-mark, confers the still greater privilege of enjoying the prerogative right (within a certain district) of seizing white swans not marked. Thus the abbot of Abbotsbury in Dorsetshire had a game of wild swans in the estuary formed by the Isle of Portland and the Chesil Bank. The swan was the largest in the kingdom, which, though formerly considerably more extensive, still numbers many hundreds of these birds, forming an object of considerable attraction and interest to those who visit this part of the south coast: it is now vested in the earl of Ilchester, to whose ancestor it was granted on the dissolution of the monasteries.

The privilege of having a swan-mark, or game of swans, is a freehold of inheritance, and may be granted over. But by 22 Edw. IV., c. 6, no person, other than the king's sons, shall have a swan-mark, or game of swans, unless he has freehold lands or tenements of the clear yearly value of five marks (£2 6s. 8d.), on pain of forfeiture of the swans, one moiety to the king, and the other to any qualified person who makes the seizure. In the first year of Richard III. the inhabitants of Crowland in Lincolnshire were exempted from the operation of this act upon their petition setting forth that their town stood "all in marsh and fen," and that they had great games of swans, "by which the greatest part of their maintenance is taken care of." The city of Oxford has a game of swans by prescription, though none are now kept. In the sixteenth century (when a state dinner was not complete unless a swan were included in the bill of fare) this game of swans was rented upon an engagement to deliver yearly four fat swans, and to leave six old swans at the end of the term. By the corporation books it also appears that in 1557 barley was provided for the young birds at fourteen pence a bushel, and that tithes were then paid of swans.

Two of the London Companies have games of swans, the Dyers' and the Vintners' Company, and are, with the crown, the principal owners of swans in the Thames. In August, 1541, the queen had two hundred and thirty-two, the Dyers one hundred and five, and the Vintners one hundred swans in the river. Formerly the Vintners alone had five hundred. The swan-mark of the Dyers' Company is a notch, called a 'nick,' on one side of the beak. The swan of the Vintners' Company, being notched or nicked on each side of the beak, are jocularly called 'swans with two necks,' a term which has been long used as a sign by one of the large inns in London.

On the first Monday in August in every year the swan-marks of the crown and the two Companies of the city of London go up the river for the purpose of inspecting and taking an account of the swans belonging to their respective employers, and marking the young birds. In antient documents this annual expedition is called swan-upping, and the persons employed are denominated swan-uppers. These are still the designation used among the initiated, though popularly corrupted into swan-hopping and swan-hoppers.

The swan-uppers proceed to the different parts of the river frequented by the swans for breeding, and other places where the birds are kept. They pay half-a-crown for each young bird to the fishermen who have made nests for the old birds, and two shillings per week to any person who during the winter has taken care of the swans by sheltering them in ponds or otherwise protecting them from the severity of the weather.

Where, as it sometimes happens, the cob bird (male) of one owner mates with a pen bird (female) belonging to another, the brood are divided between the owners of the parent birds, the odd cygnet (except in Buckinghamshire) being allotted to the owner of the cob.

The young or brown birds, being marked with the marks of their respective owners and pinioned, are put into the river, as are also the white or old swans after the completing of the pinioning of such of them as, on account of their weakness, had in their first year been deprived of one joint only of the wing. If any white swans are found in an open and common river, he seizes them, and the crown mark is put upon them. But swans kept in private waters need not be marked. A subject who has white swans not marked in his private waters may retake them upon fresh pursuit, if they escape therefrom into an open and common river; though it is otherwise if they have gained their natural liberty, and are swimming in open rivers without such pursuit.

The king had formerly a swanherd not only on the Thames, but in several other parts of the kingdom. We find persons exercising the office of "master of the king's swans" (sometimes called the swanship,) within the counties of Huntingdon, Northampton, and Lincoln, and at the same time the office of "supervisor and approver" of all swans being within any mere or water of the first three counties.

Antiently the crown had an extensive swannery annexed to the royal palace or manor of Clarendon in Wiltshire. It had also a swannery in the Isle of Portland, and by an order of council, 11th March, 1635, now at the Privy-Council Office, it appears that the inhabitants complained that their means of maintaining their families by furnishing the country with swans were lessened by "common shooters in guns." Stealing swans marked and pinioned, or unmarked, kept in a mote, pond, or private river, and reduced to tameness, is felony. Stealing swans not so marked or so kept, or so pursued, is merely a trespass or misdemeanour.

The law is said to have formerly been, that when a swan is stolen in an open and common river, lawfully marked, "the same swan (if it may be) or another swan shall be hung in a house by the beak, and he who stole it shall, in recompense thereof, be obliged to give the owner so much wheat that may cover all the swan; by putting and turning the wheat on the head of the swan, until the head of the swan be covered with the wheat."

Under the 11 Henry VII., c. 17, stealing the eggs of swans out of their nests was punished by imprisonment for a year, and a fine at the king's pleasure. But this enactment was superseded by the 1 Jac. I., c. 27, s. 2, which declares that every person taking eggs of swans out of their nests, or wilfully breaking or spoiling them, may upon conviction before two justices be committed to goal for three months, unless he pays to the churchwardens for the use of the poor twenty shillings for every egg; or, after one month of his.
commitment, become bound, with two sureties in twenty pounds a-piece, never to offend again in like manner.

The 2 Henry IV., c. 21, which directs that no lord shall give any livery or sign to any knight, esquire, or yeoman, contains a proviso, that the prince may give his honourable livery of the Stan to his lords, and to gentlemen his memians.—Slightly abridged from the Penny Cyclopædia.'

CHIFFONNIERS OF PARIS.

The extension of industry during the last thirty years has added to the dignity of this profession, which is alike followed by men, women, and children. It requires no apprenticeship, no previous course of study, no expensive outfit: a large and compactly-shaped basket, a stick with a hook at the end of it, and a lantern, are the entire stock-in-trade of this singular species of labourers. The men gain, on an average, and according to the season of the year, from twenty-five to forty sous a day; but to do this they are obliged to make three rounds, two by day and one during the night; their labour commencing at five in the morning and ending at midnight. Between their rounds they examine and sort the cargoes which they bring in, and which they term their merchandize; and, having done so, go and sell the arranged treasures to the master or managing chiffonnier: for, like all other professions, this has its gradations of ranks, the higher of which are only reached after long periods of subordinate labour. Many of these chiefs keep furnished lodgings, which they let out exclusively to those abuletary chiffonniers who have no fixed residence: reserved for their own use, the ground-floor as a magazine for their wares. The important operation of sorting his booty, if the chiffonnier is one of the better class, and desirous of a healthy lodging, is performed either in a separate room hired for the purpose, or, when the weather will permit, in the open air; but the far greater number possess only a single room, and it is here carried on by their children, and the trade is spread out, examined, and the spoil produced of each journey. The floor is covered with rags, fragments of animal substances, glass, paper, and a thousand other things, some whole, some broken, and all begrimed with dirt; whilst the several selections fill all the corners of the room, and are heaped up under the bed. A strong hot drink is almost necessarily got by the stench, which is rendered still more offensive by one, and sometimes two large dogs, which form part of the domestic establishment of most chiffonniers, and which they take out with them in their nocturnal rounds. It is matter of astonishment that habit should enable these people to endure with impunity the prolix exhalations amidst which they live. The breath of the chiffonnier is not merely the receptacle of his merchandise, it is also his market-basket: among all the filthy trash which he collects, he takes care not to neglect the luxuries of his table—vegetables for his soup, pieces of bread, half-rotten fruit, everything which he conceives to be eatable. It is not amusing to watch the sorting of all this, and to listen to the professional swears and oaths which accompanies the business when the sorter is in good temper, as he generally is, if his basket has been well filled and you address him with civility. Squatting down before it, he will show you, with a smile of exultation, a large beef-bone—a perfect beauty—and other articles of equal worth; and he shows his sorter cheeps his pavement, he will tell you that companies kills them—a that cooks have become dead to all sense of humanity, that they now make money of everything, bones and broken glass especially!" These ragamuffins have their moments of good fortune and joy—it is when, in breaking apart a mass of filth, they see glittering before their eyes a silver spoon or fork; and, thanks to the carelessness of servants, these rich prizes are not of rare occurrence. The happy individual forthwith proceeds to the barrier with his friends, generally in a hackney-coach, to celebrate the event by a copious repast, the coachman, who anticipates the dirty state of his cushions, being the only dissatisfied individual of the party. The daily gain of the lady-chiffonniers amounts to, perhaps, fifteen or twenty sous; that of the children, to about ten. Many children, who run away from their parents at a very early age, take this trade as a means of subsistence. The life they lead is almost savage: they are remarkable for the audacity and harshness of their manners. Some become so perfectly estranged, that they lose all recollection of their father's abode, nay, even of his name.

With all other classes of operative, the wine and spirit shop is the central resort of these rubbish-hunters. To the aged chiffonniers, still more to the aged females of the class, brandy has an attraction which nothing else can equal. These women believe, and act upon the belief, that spirituous liquors afford the same nourishment as solid food; they connect that the artificial element which is added to wine and the use of them is genuine strength; and the error is persisted in until the constitution is destroyed. No wonder that the rate of mortality in this class is so high.

All the lower ranks display a certain pride and ostentation in their expenditure at the cabaret; but the chiffonniers more than any other. Ordinary sort of wine will not suffice them; hot wine is their usual luxury, and they are vastly indignant if the lemon and sugar be not abundant. The cabaret-keepers are greatly scandalized by these extravagances—that is to say, when a difficulty occurs, as it frequently does, in making up the reckoning. The generous sentiments which animate the better class of operatives are totally wanting among these people: shunned and scorched by every one, they in return shun and hate all their fellow-creatures; they affect a cynic tone and manner, and appear to pride themselves on proclaiming their degradation and their vice. A considerable proportion of the men have passed through the hands of justice; and many of the women are prostitutes of the lowest order.—From the Quarterly Review, No. 130.

ANTICITY OF BENEFIT CLUBS.

Benefit Clubs, or Friendly Societies, may trace their origin to the earliest period of the English history; for that those writers are mistaken who suppose that the introduction of guilds or fraternities (which, possessing a stronger tincture of religion, were in many other respects similar to the modern clubs) was subsequent to the Conquest is evident from several curious Saxon deeds (now preserved in the Museum) which Dr. Hooke has transcribed and inserted in his learned work on Northern Literature.

There is an extraordinary coincidence between the rude simplicity which pervades the ordinances of two of the Saxon Guilds, and some of the modern Friendly Societies. It appears from many curious deeds, that Guilds were originally instituted by the mutual agreement of friends, and for the protection of the relief of the brethren in times of distress, and perhaps the protection of the associated members.
against the lawless attacks of powerful neighbours. Some pious offices, however, were the never-failing concomitants of this institutions. After the Conquest, Guilds were established for the express promotion of religious trade; and it is from these fraternities, simple as they may originally have been, that the various companies and city corporations in this kingdom are derived. The rules of several of these institutions are preserved. Among others, the following ordinance of St. Catherine’s Guild at Coventry (founded in the reign of Edward III.) is well deserving of attention of village legislators—"It is ordained, that if a member suffers from fire, water, robbery, or other calamity, the Guild is to lend him a sum of money without interest. If sick or infirm through old age, he is to be supported by his guild according to his condition. If a member falls into bad courses, he is first to be admonished, and if found to be incorrigible, he is to be expelled. Those who die poor, and cannot afford themselves burial, are to be buried at the charge of the Guild. Lastly, the Chaplain is not to frequent common taverns or public-houses.

**FEMALE FARMERS.**

That females are not disqualified from shining in the most active and laborious spheres of life, the following interesting biographical sketch, which is taken from Sir F. M. Eden’s History of the Labouring Classes in England, seems to afford very satisfactory evidence—"Mrs. Sarah Spencer was the daughter of one Spencer, a yeoman in her native county, and keeper of the gaol for the same. She was a woman of superior talents, and possessed only a competent landed estate, and being neither engaged nor in circumstances to engage in any lucrative profession, like too many others in this age of universal commerce, insensibly dwindled to nothing; and though she had been well and genteelly educated, and with such views as are common to people in her sphere of life, yet on the demise of her father she found her whole fortune did not amount to quite 300L. Her sister Mary, a woman of perhaps inferior goodness of heart, though certainly of very inferior abilities, was left in a similar predicament.

Their persons, though not uncomely, were not so attractive as to render them that without fortunes they could marry advantageously; and a mere clown was not much more likely to be happy with them, than they could have been with him. They either had no relations on whom they would have been permitted to quarter themselves, or they thought such a state of dependence but a more specious kind of beggary. Yet, living in an age and country in which well-educated women not born to fortunes are peculiarly forlorn, with no habits of exertion, nor even of a rigid frugality, they soon found that, thus unable to work and ashamed to beg, they had no prospect but that of pining to death in helpless and hopeless penury.

"It may be questioned, perhaps, whether even the most resolute spirits have virtue enough to embrace a life of labour, till driven to it by necessity; but it is no ordinary effort of virtue to submit to such a necessity with a becoming dignity. This virtue these sisters possessed: at a loss what else to do, they took a farm; and, without ceasing to be gentlewomen, commenced farmers. This farm they carried on for many years, much to their credit and advantage; and, as far as example goes, in an instance more example, is certainly of most effect, not less to the advantage of their neighbourhood. To this day the marks of their good husbandry are to be seen in the village of Rottington.

"How is it to be accounted for, without reflecting on both the good sense and the virtue of those persons in the community whom a real patriotism is much disposed to respect, namely, the yeomanry and the peasantry of villages, it might not be easy to say; but the fact is inadmissible, that a case which had been most distinguished for their endeavours to promote improvement in agriculture have but rarely been popular characters. This was the hard fate of the Spencers; who, instead of gratitude, long experienced little else than discourteies and opposition in the neighbourhood. The more active of them was called Captain Sally; and her sister, her Man Mary. With this gentle sort, the more they tried, the less they were invited to, and about the only service they were of use was to raise up the lawless attacks of powerful neighbours. The more they continued to do, the more was the want of encouragement felt. The more they tried, the more they were tempted to think that the world had gainsaid their virtues. And the very same principle, that the gastric juice will, when the individual dies, dissolve the very stomach that had secreted this powerful solvent, and had resisted its action when living. The knowledge of this fact was the means of acquiring an individual accused of the crime of poisoning.——Holland’s Philosophy for the Public.

**Interruptions of Literary Labour.**—When Montesquieu was deeply engaged in his great work, he wrote to a friend:—"The favour which your friend Mr. Heinoftendoes to me, permits me to pass this evening with you, although I am not at all at ease; for your friend Mr. Heinoftendoes is my idol. The same with you, my dear friend: you are my idol. I am a mere student in my friend Mr. Heinoftendoes’s profession. The same with you, my dear friend. I am a mere student in my friend Mr. Heinoftendoes’s profession. But I am much in my friend Mr. Heinoftendoes’s way. The same with you, my dear friend. I am a mere student in my friend Mr. Heinoftendoes’s profession.

The Gastric Juice.—Worms in the alimentary canal resist the agency of the gastric juice so long as they are alive; but when dead, they are then subjected to the laws which govern inanimate matter, and are, consequently, digested or expelled like any ordinary contents. This fact affords a good reason for using cold boiled water, as the high temperature to which it is raised must kill the animalculae that may be found in this fluid, and thus they are rendered easy of digestion. It is a remarkable circumstance, first observed by John Hunter, and referrible to the same principle, that the gastric juice will, when the individual dies, dissolve the very stomach that had secreted this powerful solvent, and had resisted its action when living. The knowledge of this fact was the means of acquiring an individual accused of the crime of poisoning.——Holland’s Philosophy for the Public.
BEACONS.

Hadley, so called from its elevated situation (head leagh, a high place), is about 11 miles from London, and a short distance eastward of the town of Chipping Barnet. The parish was formerly a hamlet of Edmonton. The church was erected during the fifteenth century, and consists of a chancel, nave, two aisles, and two transepts. There are several monuments of the seventeenth century, the most remarkable one being that in memory of Sir Roger Wilbraham, solicitor-general of Ireland in the reign of Queen Elizabeth, and his lady, with marble busts of each by Stone; and there is a mural brass of the fifteenth century. At the west end there is a square tower of flint with stone quoins, at the top of which is an iron beacon.

The Anglo-Saxon word beacon signifies a sign or signal, and the use of beacons was to alarm the interior of the country upon the approach of a foreign enemy. These sort of fire-signals are of the highest antiquity, and are mentioned in the prophecies of Jeremiah (ch. vii., ver. 1), who says:—"Set up a sign of fire in Beth-laccerim, for evil appeareth out of the north, and great destruction." Æschylus, who wrote his tragedies in the fifth century before the Christian era, represents the intelligence of the capture of Troy as being conveyed to the Peloponnesus by fire-beacons. They were used during the Peloponnesian war (431 to 404 B.C.). Pliny distinguishes this sort of signal from lighthouses by the name of 'Ignes præminulitii,' or notice-giving fires. At this day the natives of Australia light fires as signals, which are repeated from one party to the other, and in this way notice is communicated to a great distance in a very short time.

Lord Coke, in his 'Fourth Institute,' gives a description of our own beacons before the fourteenth century:—"Before the reign of Edward III.," he says, "they were but stacks of wood set up on high places, which were fired when the coming of enemies was described; but in his reign pitch-boxes, as now they be, were, instead of those stacks, set up; and this properly is a beacon." Stow, in his 'Annals,' under the year 1326, states that among the precautions which Edward II. took to guard against the return of the queen and Mortimer to England, "he ordained binkens or beacons to be set up, that the same being fired might be seen far off, and thereby the people to be raised." The power of erecting beacons was originally in the king, and was usually delegated to the lord high admiral. In the reign of Edward II. (1307—1327), the sheriff of the county levied a sum upon each hundred under the name of 'beconagium,' for the maintenance of beacons.

In the British Museum there are preserved charts of the coast of Dorsetshire and Suffolk, showing the station of the various beacons at the time of the expected invasion of the Spanish Armada. Beacon hills occur in some part or other of most of the counties of England. In unsettled times watches were regularly stationed at these spots, and horsemen called 'hobblears' were stationed to give notice in the daytime of an enemy's approach, when the fire would not be seen. Sir John Fenn, in a note to the 'Paston Letters,' says that these light horsemen, "by the tenure of their lands, were obliged to maintain their nags, and were expected to be in readiness, when sudden invasions happened, to spread immediate intelligence of the same throughout the country." The guard at the sea-side beacons was required to be larger than at the inland
beacon, as it was often one of the first objects of an invading party to surprise them, and so prevent the alarm of their arrival being spread far and wide.

When the Armada was expected directions were issued that the beacons be provided with good matter and stuff, as well for the sudden kindling of the fires as also for the continuity thereof. The blazing of the beacon-fires from a hundred hills, rousing the stalwart spirit of our forefathers in many a remote hamlet and lonely moated grange, would be a moment of intense interest. The inhabitants of a certain district assembled at the particular beacon which by its lurid glare amidst the darkness of night had summoned them from their homes; and in this way the gathering together of an armed force would soon be effected; while, as all pushed forward to some general point, their numbers would swell into a large army. It is reported that the last occasion of Hadley Beacon being used was in 1745, when it lighted the way for the household troops on their progress northwards, immortalised by Hogarth in his exquisite "March to Finchley."

At the commencement of the present century, when the invasion of the country by a foreign enemy was generally expected, the beacons were once more put in order, and occasionally some were fired, either as a strategical experiment, to ascertain the force which could be brought into action in each case, or as a rumour that the enemy had really landed. How completely altered are now all the means of dispatch and publicity compared to what they were a few centuries ago. Now we have the telegraph, which is capable of transmitting many facts, instead of one only, from one end of a country to the other in the space of a few minutes; and it is serviceable by day, which the beacon was not; and if recourse were had to a fire-signal for night communication, a piece of lime not bigger than a boy's marble, exposed to the action of a flame which in itself is scarcely luminous, would be made to yield a light so intense as to be visible at a distance of sixty or seventy miles. The concentration of an armed force could be effected upon any part of the coast in a few hours by means of railroads. The invaders, instead of waiting days perhaps for a favourable wind before they could descend upon our coasts, would make their unerring approach aided by the power of steam; and on the other hand, fleets of armed steamer would oppose them. Let us hope that the time is far distant for a trial of these new resources of war, which modern science has placed in the hands of civilized nations.

The Winfarthing Oak is seventy feet in circumference, the trunk quite hollow, and the cavity large enough to hold at least thirty persons. An arm was blown off in 1811, which contained two waggon-loads of wood.

"Of the age of this remarkable tree," says Mr. S. Tayler, in a letter to Mr. Loudon, "I regret to be unable to give any correct data. It is said to have been called the "Old Oak" at the time of William the Conqueror, but upon what authority I could never learn. Nevertheless, the thing is not impossible, if the speculations of certain writers on the age of trees be at all correct. Mr. South, in one of his letters to the Bath Society (vol. x.), calculates that an oak-tree forty-seven feet in circumference cannot be less than fifteen hundred years old; and Mr. Marsham calculates the Bentley Oak, from its girthings thirty-four feet, to be the same age. Now, an inscription on a brass plate affixed to the Winfarthing Oak gives us the following as its dimensions:—"This oak, in circumference, at the extremities of the roots, is seventy feet; in the middle, forty feet; 1820." Now, I see no reason, if the size of the rind is to be any criterion of age, why the Winfarthing should not, at least, equal the Bentley Oak; and, if so, it would be upwards of seven hundred years old at the Conquest; an age which might very well justify its title of the "Old Oak." It is now a mere shell—a mighty ruin, bleached and magnificently in its decay; and I do wonder much that Mr. Strutt should have omitted it in his otherwise satisfactory list of tree worthies. The only mark of vitality it exhibits is on the south side, where a narrow strip of bark sends forth a few branches, which even now occasionally produce acorns. It is said to be very much altered of late; but I own I did not think so when I saw it about a month ago (May, 1836); and my acquaintance with the veteran is of more than forty years' standing; an important portion of my life, but a mere span of its own."

"The Salesy Forest Oak, Sir Thomas Dick Lauder describes as one of the finest specimens of the picturesque sylvan ruins that can be met with anywhere." It is supposed to be above fifteen hundred years old; and its trunk is so decayed, as to form a complete arch, which is fourteen feet eight inches high, and twenty-nine feet in circumference. The tree is thirty-three feet high, and about forty-seven feet in circumference on the outer bark. It is said to be very meagre in its decay; and, though it has latterly become much wasted, it annually produces a crop of leaves and acorns.

The Parliament Oak grows in Clipstone Park, Nottinghamshire, and derives its name from a parliament having been held under it by Edward I. in 1290. The girth of this tree is twenty-eight feet six inches. Clipstone Park is the property of the Duke of Portland, and is supposed to be the oldest park in England, having been a park before the Conquest, and having been then seized by William and made a royal demesne. Both John and Edward I. resided and kept a court in Clipstone Palace. To this we owe the statement of a correspondent of the Doncaster Gazette of June 24 of the present year, as to the condition of this venerable tree:—"From my own actual measurement," says he, "the dimensions are as follows:—Height of the trunk, twenty feet; circumference on the ground, twenty-seven feet seven inches; circumference on the branches, twenty-three feet; height of the branches, the largest limb is eighteen feet, and the second sixteen feet in circumference.

* See No. 514, for an account of the Drummond and Bute Lights.
sured, in 1810, as follows:—Girth, close to the ground, forty-four feet three inches; five feet from the ground, twenty-seven feet four inches; height to the principal bough, forty-one feet six inches. (Gent. Mag., Oct. 1810.) The tree was very much decayed in 1813, and had a hollow at the bottom sufficient to hold with ease half a dozen persons. (Beauties of England and Wales; Shropshire, 179.) This oak was celebrated for Owen Glendower having mounted on it to observe the battle of Shrewsbury, fought on June 21, 1403, between Henry IV. and Harry Percy. The battle had commenced before Glendower arrived; and he ascended the tree to see how the day was likely to go. Finding that Hotspur was beaten, and the force of the king was overpowering, he retired with his twelve thousand men to Oswestry.

"The Grindstone Oak, near Farnham, was once an enormous tree. Its circumference, near the ground, is still forty-eight feet; and at three feet high, thirty-three feet. It is, however, fast waning to decay."

"The Bull Oak, in Wedgwood Park, is a remarkable specimen of an oak of this kind. It measures at one foot from the ground for four feet four inches; and at six feet for fifteen feet three inches, in circumference. The height of the trunk is about seventeen feet before it throws out branches. The inside is quite decayed; and, being open on one side, cattle are generally found sheltering in it. The head is still in a vigorous and flourishing state. The Gospel Oak stands near Stoneleigh, in Warwickshire. It derives its name from the custom, which formerly prevailed, when the minister and other officers of the parish went round its boundaries in Rogation Week, of stopping at remarkable spots and trees to recite passages of the Gospel."

"The Cowthorpe Oak is a very remarkable tree. The following are the dimensions of this tree, as given in Hunter's 'Evelyn.'—Close to the ground, it measured seventy-eight feet in circumference; and at three feet from the ground, forty-eight feet. The following account was sent to us by a correspondent in Yorkshire, in October, 1829:—Cowthorpe is a small village on the right bank of the river Nid, in the wapentake of Clare, in the West Riding of the county of Yorkshire. One hundred and fifty yards from the great road from London to Edinburgh, where it crosses the river by Walshford Bridge. This stupendous oak stands in a paddock near the village church, and is the property of the Hon. E. Petre, of Stapleton Park, near Ferrybridge. On a stranger's first observing the tree, he is struck with the majestic appearance of its ruined and riven-looking dead branches, which in all directions appear above the luxuriant foliage of the lateral and lower arms of the tree. In 1722 one of the side branches was blown down in a violent gale of wind; and, on being accurately measured, was found to contain upwards of five tons of wood. The largest of the living branches at present extends about forty-eight feet from the trunk; and its circumference, at about one yard from the giant bole, is eight feet six inches. Three of the living branches are propped by substantial poles, resting upon stone pedestals. The diameter in the hollow part, at the bottom, is nine feet ten inches: the greatest height of the dead branches is about fifty-six feet. It is evidently of very great antiquity, as all tradition represents it as a very old tree."

"In Bagot's Park, near Blithfield, about four miles from Lichfield, there are several very remarkable trees. Bagot's Park is the seat of Lord Bagot, who may be regarded as one of the greatest planters of oaks in the kingdom, having planted two millions of acorns on his estates in Staffordshire and Wales. (Gent. Mag., Oct. 1807.) This oak is thirty feet high, which contains six hundred and sixty cubic feet; one limb, forty-four feet long; and fourteen other limbs containing altogether three hundred and forty-two cubic feet of timber. The total height is sixty-one feet; the circumference, near the ground, is forty-three feet; and at five feet, is twenty-one feet nine inches. The Rake's Wood Oak is a very old tree, and has lost many of its branches and several feet of its height. It is now about fifty-five feet high, and sixty near thirty feet in circumference at five feet from the ground. The Beggars' Oak is also in Bagot's Park, and has a trunk twenty-seven feet three inches in circumference at five feet from the ground: the height is about sixty feet. The roots rise above the ground in a very extraordinary manner, so as to furnish a natural seat for the beggars choosing to pass along the pathway near it; and the circumference taken around these is sixty-eight feet. The branches extend above fifty feet from the trunk in every direction. This tree contains eight hundred and seventy-seven cubic feet of timber, which, including the bark, would have produced, according to the price offered for it in 1812, 20L 1s. 9d.—(Lauder's Gilpin, i., p. 254.)"

"The Grindstone Oak, near Jedburgh, on the estate of the Marquess of Lothian, stands a remarkable oak, called the King of the Woods. It is now (January 19, 1837) sixteen feet six inches in circumference; one foot from the ground; its whole height is fifty-six feet: the largest of the living branches at present extends about forty-five feet from the trunk; and its circumference, near the ground, is sixty-nine feet; the height is about ninety-two feet; the branches overhang is above ninety-two feet in height; and the expanse of its foliage of the later and lower arms of the tree.

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METHOD OF REMOVING HOUSES IN AMERICA.

The removing of houses from one spot to another not far distant is not a novelty in England, and is very commonly performed at the present day in America.* While houses were constructed principally of timber, the difficulty was not very great, arising chiefly from the heavy weight to be moved, as, when loosened from their foundations, the elasticity and adhesion of their materials were sufficient to keep them together during the process; but in houses constructed of brick the difficulties are evidently greatly increased, and the necessity for a much larger share of ingenuity and contrivance required. Though this latter process is not altogether unknown in England, indeed a lighthouse in Northumberland of considerable size has been lately removed to some distance from its original site, yet it has been chiefly in America that the plan has been practised, where it has been found eminently useful in enabling them to widen the streets or improve the plans of their rapidly-growing towns. As the subject is of some interest, we will endeavour to give a description of the method of proceeding.

In the building to be removed, which must be a detached one (or the whole block may be removed if not too large), corresponding openings are made in

* Stow mentions, in his 'Survey of London,' 1598, that his father's house in Throgmorton Street was loosened from the ground, and removed on rollers to a distance of 22 feet, by the order of Thomas Cromwell, afterwards Earl of Essex, who was desirous of enlarging his garden.
each of the end walls just above the ground, sufficiently large to admit the insertion of beams about a foot or fifteen inches square, which project about two or three feet from each end, and are placed at intervals of about four feet from each other (marked 1 in the engravings); the projecting ends resting on blocks of wood fixed firmly on the ground, clear of the walls. When the beams are placed, wedges are driven between their projecting ends and the fixed blocks in order to drive them up tightly against the upper part of the wall, thus supplying the place of the bricks knocked away, and supporting the weight of the walls. This done, the foundation of the end walls may be removed, the intermediate brick-work taken away, and a clear space left for further operations. The same operation is then pursued with the front and back walls, the beams, No. 2, passing below and across those first laid, and resting like them on blocks outside the walls. The foundation being now wholly laid bare, the two sets of timbers are forced closely up to each other and to the brick-work by upright screws placed on the ground beneath them, No. 3. This operation relieves the blocks, on which the projecting ends rested, of the weight of the house, and they are taken away; the house now resting entirely on the timber frame-work, sustained by the screws. The ground beneath is now dug away, and a set of fixed slides, or ways, as they are commonly called (6 in engravings), are placed exactly where the foundations of the end walls had previously stood; on these ways, in which deep grooves are cut, are placed a set of cradles, similar to those used in ship-yards (5 in engravings), which have a projection or feather, corresponding with and intended to move in the grooves of the ways, both being previously well greased, and between these cradles and the timbers marked 2 the beams marked 4 are inserted at right angles with both pieces of wood, and wedges are then driven in at various parts to tighten the whole in order to bring the entire weight of the building on to the cradles, and, being made to act together, the cradles with their burden move along the ways at the rate of three or four feet per day to their place of destination. When arrived there, by inverting the process, the timbers are withdrawn one by one, and the house is permanently fixed in its new situation without injury to itself, and frequently without even removing the furniture.

The following curious accounts of the application of this invention in New York, we give in the words of the correspondent, to whom we are indebted for the materials of the previous notice:

"Chapel Street, in New York, was widened by order of the Corporation; many of the houses were moved back, and some pulled down. At the corner of Chapel and Leonard streets stood a large and strong brick building used as a blacksmith's workshop: this lying in the way of the improvement, had to be removed: it was sold by auction, and was purchased very cheaply by a person who owned a small house adjoining it in Leonard Street, with some ground behind it. The speculative purchaser first moved the small house in Leonard Street, beyond the extremity of the blacksmith's shop, and turned its front towards Chapel Street; he then moved back the blacksmith's building the required number of feet, and brought it on a level with the small house previously moved. Out of the old workshop he formed three handsome three-story houses, with shops, and made additions to the small house, so that the whole now presents a line of four houses.

"In a more recent improvement, Centre Street was widened and extended, in order to join a main thoroughfare by the City Hall. Many houses were pulled down, and carried back as in other instances, but there was one well-built brick house that stood completely across the proposed roadway. There was not sufficient room on either side to receive it wholly, so the ingenious proprietor, rather than sacrifice his house, conceived the idea of dividing it from top to bottom through the three floors: this he actually accomplished, and the two distinct parts were conveyed to opposite sides of the street, in which state I saw them before the chasms in the walls had been supplied. He then perfected them, and they form now two separate, though narrow buildings.

"The cost of moving a moderate-sized brick dwelling is about one hundred dollars, very considerably less, even with the new brick-work, than the expense of pulling down and rebuilding, besides saving much time. A Mr. Simeon Brown of New York is said to have been the projector of this peculiar and useful operation: he died, I believe, only a few months since."
RECENT IMPROVEMENTS IN LIGHT-HOUSEES.

Since our descriptions of the Eddystone and North Foreland Lighthouses were published in Nos. 20 and 222 of the 'Penny Magazine,' many projects have been partially or fully acted on, tending to the introduction of considerable changes in the general principle of construction in these invaluable beacons. We shall endeavour, in two short papers, to present a general outline of the improvements to which we allude, and which we may classify thus:—1st, lighthouses constructed of iron; 2nd, Mitchell's screw-pile lighthouses; 3rd, beacons for sand-banks; 4th, lighthouses for sand-banks; 5th, suggested improvements in the lights or lamps.

In a country where we have iron ships, iron carriages, iron roads, and iron buildings, it is not wonderful that the employment of the same metal as a material for lighthouses should have been suggested. Consumers was the skill displayed by Smeaton in the Eddyestone lighthouse, we are disposed to think that a much less ponderous mass of material will be generally used in future operations of the kind. But without entering into the future, we may notice what is now doing in this way. When it was proposed a few years ago to construct a lighthouse on the Wolf Rock near the Land's End, Captain Brown, the engineer of the Brighton chain-pier, offered to construct one of iron, or, at a higher cost, of bronze. He proposed that it should be ninety feet high, fourteen feet in diameter at the bottom, and four at the thickest part; the structure being built up of separate truncated conical pieces of cast-iron, fitting one on another something like the joints of a telescope. Above the column was to be a keeper's house, surrounded by an open gallery which overhung the pillar, and surrounded by the lantern. Within the body of the column were to be the sleeping-berths for the attendants; and store-rooms for provisions, coals, water, and oil. Captain Brown's estimate of the advantages likely to result from the adoption of such a plan related to the following points:—That the expense would be very much smaller than that of a stone lighthouse; that the time of erection would be much shorter; and the details of its construction (for which we are indebted to the 'Civil Engineer's Journal') are as follow:—The engineer, Mr. A. Gordon, formed the design after the Celtic or round towers of Ireland; and Messrs. Bramah and Robinson, of Pimlico, exhibited the whole on their premises in about three months from the time of the contract being made; a striking proof of rapidity with which plans can be put into execution. As the diameter is much larger than that mentioned in the preceding paragraph, the circumference is formed of several pieces, instead of one.

The tower or shaft is founded on a coral rock, a little above the level of the sea; the face of this rock is covered in many places by a sandy stratum, which will be excavated to receive the base of the tower, resting on and casued with granite, to prevent the filtration of sea-water from acting on the iron. This course of granite is grooved to receive the lower plate of the tower, from which lighting-conductors are to proceed to the sea. The diameter of the tower-shaft is eighteen feet six inches at its base, diminishing to eleven feet at the top; it is formed of nine tiers of plates, each ten feet in height, from four to five feet in width, and nearly an inch thick. The circumference is formed of eleven plates at the base and nine at the top; they are cast with a flange all round the inner edges, and when put together these flanges form the joints, which are fastened together with nut-and-screw bolts, and caulked with iron cement. The 'cap' to the column consists of ten radiating plates, which form the floor of the light-room: they are secured to the tower upon twenty pierced brackets, and are finished by an iron railing. The lower portion of the tower, to about one-fourth of its height, is filled up with masonry and concrete to form a solid centre; and above this are the necessary rooms for the attendants and the stores. The light-room consists of cast-iron plates five feet high, whereon are fixed metal shelf-bars filled with plate-glass. The height of the upper part of the light is regulated by a plan related to the following points:—That the expense of the screw is attached links and other apparatus whereby it can be connected with the cable of a ship, and thus a mooring-anchor is produced.

The next improvement we have to notice is that of Mitchell's screw-pile lighthouse, one of the most remarkable applications of the screw ever perhaps proposed. The first improvement was, we believe, in reference to moorings for ships, which, under the common system, usually consist of a strong chain stretched along the bed of the harbour or port, and secured at its extremities by anchors or heavy blocks of stone, the ship being connected with the chain by a cable. Under these circumstances accidents often occur, such as a ship's anchor catching in the ground-chain, or a ship's keel striking on the mooring-block. To obviate these evils, and to lessen the expense of constructing moorings, Mr. Mitchell devised a cast-iron instrument which screws into the soil forming the bed of the river, and thus obtains a very powerful hold. The screw is formed of two to five diameter, in diameter, according to circumstances; but its thread, or inclined path, winds only one and a half times round the centre. At the upper end of the screw (the length of which about equals the diameter), the shaft or spindle is brought to a square shape, so as to be wound round by a key exactly as a pocket-watch is wound up. A key is formed of jointed rods, placed end to end, the sufficient length is acquired; and by this means the screw is turned till it wholly enters the ground, where it 'bites' or clings so tightly that an immense force would be necessary to tear it up. To the upper end of the screw is attached links and other apparatus whereby it can be connected with the cable of a ship, and thus a mooring-anchor is produced.
The success which attended this invention led the Corporation of the Trinity House to consider how far the principle might be available in the construction of light-houses on sand; and Mr. Walker, their engineer, was directed to test the question on the Maplin Sands lying to the north of the Thames, about twenty miles below the Nore. This sand, which is a shifting one, and dry at low-water, forms the northern side of the King's Channel, through which a large number of ships pass on their way up the river. As the sand has not stability enough to support masonry, the idea was conceived of building a skeleton lighthouse whose principal parts should be screwed into the soil on Mitchell's principle. In August, 1838, operations commenced. Eight shafts of wrought-iron were inserted in the sands, nearly upright, and arranged so as to form an octagon, with a ninth quite upright in the centre. These shafts were about twenty-five feet long, and five inches in diameter; and at the lower end of each was a screw nearly five feet in diameter. It was by this means that the shafts were made to penetrate the sands, which they did to the depth of twenty feet, the screws being driven by thirty men acting on a capstan erected above. In about nine days all the nine shafts were driven, till their upper ends stood about five feet above the surface of the sand, and forty feet in diameter from each other. The foundation being thus made, matters were left till the spring of 1839, when the intervening space was strengthened in various ways; and the manufacture of the superstructure resolved on. After some delay, the framing was commenced in August, 1840. The lower part consists of eight cast-iron pillars, eighteen feet long, eleven inches diameter externally, and ten inches internally: these are fixed at the angles of the octagon, and a ninth is placed in the centre. The lower part of each pillar forms a socket, which is fitted over the top of the corresponding screw-shaft to the extent of four feet, and there fastened by screws. These pillars incline towards the centre; and at the upper end of each is a socket for receiving the principal parts of the timber framing. The pillars, which are braced and bound together strongly, stand about four feet above the highest water-mark. On these pillars is erected a frame-work of stout timbers, consisting of beams proceeding in various directions, and fastened firmly to the pillars. The hold obtained for these shafts are erected pillars of timber, fitting by sockets in the upper end of the shafts; and above these again is a dwelling for the attendant, and a house or lantern to contain the light. The main structure, too, instead of presenting to the violence of the waves a surface which has, in some instances, been supposed to be exposed to a pressure of one hundred tons, consists only of skeleton frame-work, presenting the least possible amount of resisting surface. One of the most remarkable circumstances connected with this mode of construction is the celerity with which the various parts can be put up. The Wyre lighthouse was reared in two winter months, when the amount of daylight was so small as to render necessary the prosecution of the operations by moonlight or light of flaminbeaux! [To be continued.]

German Wagons.—There is a great trade in charcoal here; they are loading it now; and they contrive to put enormous loads in their light and slight wagons, with wheels not larger than the fore-one of our carriages in England. But the perch is moveable, and they can make it any length they please: it is of so simple a construction that every farmer can repair his own, and make anything of it. If he has a perch, a pole, and four or six wheels, that is enough: with a little ingenuity he makes it carry stones, hay, earth, or anything he wants, by putting a plank at each side. When he wants a carriage for pleasure, he fits it up for that purpose; his moveable perch allows him to do it anything. I counted seventeen of them, side by side, looking most happy, in one of them, drawn only by a pair of small horses, and in this hilly country. If the farmers in England would adopt these light wagons, instead of their own expensive heavy ones, it would be a great saving, and the roads would not be ground into deep ruts as they are now.—Lady Yaver's Last Tour and First Work.
THE JACKAL, OR TSCHAKKAL.

This animal is of a yellowish-grey colour above, whitish below, thighs and legs yellow, ears ruddy, muzzle very pointed, tail reaching hardly to the heel (properly so called). The colours sometimes vary, and the back and sides are described by Mr. Bennett as of mixed grey and black, and as abruptly and strikingly distinguished from the deep and uniform tawny of the shoulders, haunches, and legs. The head nearly of the same mixed shade with the upper surface of the body. It inhabits India and other parts of Asia, and Africa. Cuvier says that jackals are met with from India and the environs of the Caspian Sea to Guinea, but that it is not certain that they are all of the same species. Their habits gregarious, hunting in packs, and the pests of the countries where they are found, and where they burrow in the earth. In their huntings the jackals will frequently attack the larger quadrupeds, but the smaller animals and poultry are their most frequent prey. Their cry is very peculiar and piercing. Captain Beechey notices it as having something rather appalling when heard for the first time at night; and he remarks, that as they usually come in packs, the first shriek which is uttered is always the signal for a general chorus. We hardly know," continues the Captain, "a sound which partakes less of harmony than that which is at present in question; and indeed the sudden burst of the answering long-protracted scream, succeeding immediately to the opening note, is scarcely less impressive than the roll of the thunder-clap immediately after a flash of lightning. The effect of this music is very much increased when the first note is heard in the distance (a circumstance which often occurs), and the answering yell bursts out from several points at once, within a few yards or feet of the place where the auditors are sleeping.

The jackal is frequently alluded to in the sacred writings. "The Hebrew word shaul," says the author of the 'Illustrated Commentary on the Old and New Testaments,' speaking of the use made of them by Samson, "rendered 'fox' in our version, is now generally agreed to be, in most cases, the jackal (canis amensis). This animal is well enough depicted as something between the wolf and the fox, whence some naturalists are disposed to describe it as 'the wolf-fox.' It is about the size of the former animal. The upper part of the body is of a dirty yellow; a darker mark runs upon the back and sides; and the under parts are white. The jackals associate together like the wolves, and form large packs, sometimes, in Palestine, of about two or three hundred; differing in this respect from the fox, which is not gregarious. In such packs, they prowl at night in search of prey, which chiefly consists of carrion, to obtain which they approach to the towns and villages, and sometimes enter and prowl about the streets when they can gain admittance. In some towns, large numbers remain concealed during the day, in holes and corners, which they leave at night to scour the streets in search of food. It is often necessary to secure the graves of the recently dead with great care, to prevent the corpse from being disturbed and devoured by these animals. The howlings of these packs of jackals are frightful, and give great alarm to travellers; hence they are also called in Hebrew ayin, 'howlers.' They do not molest man, unless when they can do so with great advantage, as when he lies asleep, or disabled by wounds or sickness. The jackals, like the foxes, live in holes which they form in the ground; they are particularly fond of establishing themselves in ruined towns, not only because they there find numerous secure retreats, ready made, or completed with ease, but because the same facilities attract to such places other animals, on some of which they prey. From this circumstance, the prophets, in describing the future desolation of a city, say it shall become the habitation of jackals; a prediction verified by the actual condition of the towns to which their prophecies apply. But the common fox is also of frequent occurrence in Palestine; and it appears that the Hebrews included both it and the jackal under the name of shaul, although the latter was sometimes specially distinguished as the ayin. It must therefore, in most cases, be left to the bearing of the context to determine when the jackal and the fox are respectively denoted, by the name (shaul) common to both."
NEWFOUNDLAND.

The island of Newfoundland, lying nearly opposite the Gulf of St. Lawrence, is the nearest to Great Britain of any of our North American possessions; the distance between St. John's and the harbour of Valen- cia in Ireland being only one thousand six hundred and fifty-six sea-miles. It was discovered by the Norwegians before the tenth century, but its existence seems to have been forgotten until its rediscovery in 1497 by John Cabot, then in the service of Henry VII. His report of the great quantities of fish on the coasts induced private adventurers to resort there so early as the year 1500, and in 1536 a merchant of London attempted, with the crew of his ship, to pass the winter on the island; but the hardships they endured compelled them to return to England before the winter was over. In 1583 Sir Humphrey Gilbert, half-brother to Sir Walter Raleigh, having obtained a grant of two hundred leagues round any point of the coast where he might choose to settle, proceeded to Newfoundland with two hundred people in five small ships, and formed a settlement in the Bay of St. John. Dissensions soon broke out amongst the settlers: some returned to England; and of the remainder, above one hundred were lost in one of the ships in a storm while exploring the south part of the island. Several other attempts to form a settlement also failed. In 1623 Sir George Carteret, afterwards Lord Baltimore, formed a colony in the south-eastern part of the island, which he called Avalon. He appointed his son governor, and soon afterwards proceeded to the settlement himself, in order that he might enjoy the free exercise of the Roman Catholic religion. Ten years afterwards Lord Falkland, then lord-lieutenant of Ireland, sent a body of settlers from that part of the kingdom; and in 1654 Sir David Kirk, having procured a grant of land from the Parliament, went with a few settlers to take possession. The French had in the meantime been active in establishing a settlement on the island. The French fishermen paid five per cent. on the value of the fish which they took, as an acknowledgment of the sovereignty of the British, and of that of the French. In 1675 Charles II. relinquished this tribute, and the French fishery rapidly increased. The French and English fishermen were, however, constantly in collision; and the encroachments of the French were alluded to in the declaration of war against France, issued by William III. shortly after he came to the throne, and were indeed set forth as one of the causes of the war. After alluding to the tribute which the French formerly paid as an acknowledgment of the sole right of the crown of England, the declaration stated, that “of late the encroachments of the French upon that island, and his majesty’s subjects’ trade and fishery there, had been more like the invasion of an enemy than becoming friends who enjoyed the advantages of that trade only by permission.” During this and the following war both the French and English settlements were frequently attacked. In 1708 the town of St. John’s was nearly destroyed by the French, and they had gained possession of nearly every settlement; but at the peace of Utrecht, in 1714, the sovereignty of the English was duly acknowledged: the French were permitted to occupy the small islands of St. Pierre and Miquelon, near the entrance of Placentia Bay, the garrison in each not being allowed to exceed fifty men. The French were to enjoy the rights of fishery under certain restrictions; but this subject is still in a disputed and unsatisfactory state.

Newfoundland is rather larger than England and Wales. Little is known of the interior. The shores are indented by broad and deep bays entering from forty to fifty miles into the body of the island. The western coast is generally rugged and lofty, but the eastern side of the island consists principally of low hills. The climate is humid, and especially disagreeable on the setting in and breaking up of winter, and when the fields of ice, which float from north to south during the months of April and May, are near the coast, and the wind is from seaward. The heat in summer is often very great. There are tracts of alluvial soil along the banks of the rivers, but from the nature of the climate agriculture will always be a secondary branch of industry, as the fisheries on the coast are a more profitable pursuit than the cultivation of an in-
hospital soil. In 1836 the number of acres in cultivation was eleven thousand and sixty-two, and their produce ten thousand three hundred and forty bushels of oats above a million bushels of potatoes, and nearly seven thousand tons of hay. The number of horses was one thousand five hundred and fifty-one, of horned cattle five thousand eight hundred and thirty-five, and of sheep three thousand one hundred and three. The inhabitants are for the most part dependent for provisions upon importation. In fact, if it were not for the fisheries, the island would not probably be settled at all; and as it is, large numbers only resort to it during the fishing-season, and leave it during the winter. The settlements are all upon the coast, the grand occupation of the population being exclusively in the fisheries, and in those branches of industry which are immediately connected therewith. The burthen was 98,830 tons; more than one-half were from the United States; and 252 from other foreign states. The fishery in 1836 produced 860,354 quintals of codfish, 1534 barrells of herrings, 1817 tierces of salt provisions from Ireland and Germany; biscuit from Germany; flour from the United States and the north of Europe; and Indian corn meal from the United States. The total value of the imports in 1836 was 579,799L., and of the exports 787,039L.

290  PERFORATIONS IN SHAKSPERE'S CLIFF.


The following description of St. John's, the capital of the island, is taken from the 'Penny Cyclopædia':—"The port and town of St. John's is on the east side of the island. The entrance of the harbour is so narrow that two ships can hardly pass abreast with safety. There are twelve feet water in the middle of the channel. The harbour is spacious and sheltered on all sides by high rocks; its fortifications are rather strong than extensive. The town runs along nearly the whole of the north side of the port, but there can scarcely be said to be more than one street, the others being irregular lanes. A few of the houses are of stone or brick, and some of them are handsome, but the greater part are of wood. The government and public offices are tolerably extensive. The population and public offices are tolerably extensive. The population in summer hardly exceeds ten thousand, but on the return of the fishermen it is increased to fifteen thousand."

The best

The Great Bank of Newfoundland, which appears to be a mass of solid rock, is about six hundred miles long, and in some places two hundred broad. The edges are abrupt; the soundings on the bank vary from twenty-five to ninety-five fathoms; but there is one part which is only about four fathoms. The best fishing-grounds are between 42° and 46° north latitude, south-east of the island. The temperature of the water is from 10° to 12° colder than that of the surrounding sea. In 1793 the fishery employed 400 ships, of the aggregate burthen of 38,000 tons, and 2000 boats. In 1836, 800 ships arrived in the colony, and their total burthen was 98,830 tons; more than one-half came from Great Britain and her colonies; 31 ships were from the United States; and 252 from other foreign states. The fishery in 1836 produced 860,354 quintals of codfish, 1534 barrel of herrings, 1817 tierces of salt provisions from Ireland and Germany; biscuit from Germany; flour from the United States and the north of Europe; and Indian corn meal from the United States. The total value of the imports in 1836 was 579,799L., and of the exports 787,039L."

PERFORATIONS IN SHAKSPERE'S CLIFF.

DOVER.

RAILWAY engineering is producing remarkable changes in the appearance of many spots hitherto held almost sacred by the antiquary or the poet. The 'viaduct' and the 'tunnel,' the 'embankment' and the 'cutting,' are changing the face of many such scenes in different parts of England. We may occasionally regret that such should be the case; yet so long as land is readily sold when a price is offered for it, the natural course of commercial enterprise will lead to such results. One instance of this sort is afforded in the works now in progress for the South-Eastern Railway, the remarkable improvement westward of Dover, known as 'Shakspere's Cliff.' The cliffs are broken with no fewer than sixteen channels or passages.

In our account of Dover Castle given in a former volume, the Shakspere Cliff was mentioned in a short paragraph; but the nine years which have elapsed since that article was written have witnessed singular changes in its state, and of these changes we shall present a few details furnished by a recent visit to the spot.

To understand the route of the South-Eastern Railway, through and among the cliffs westward of Dover, it will be necessary to bear in mind the general character of the coast. From the South Foreland to Folkestone, a distance in a straight line of probably ten miles, the Kentish coast presents a succession of high cliffs so little broken that there is only one spot in the intervening distance where a town could be built on the sea-shore: this is the spot occupied by Dover. At Dover the cliffs recede from the sea, insomuch that, instead of being washed by the waves, they are situated so far inland as to allow a part of the town to be built on the shore between them and the sea. There is also a complete break or valley in the cliffs at this part, by which the road to Dover from Canterbury enters the town; and along this depressed portion the remainder of the town is built. Dover thus lies in a hollow, on the eastern side of which is a bold cliff surmounted by the castle: from this latter a complete view of the
whole town can be obtained. Westward of the depression, which we have called the valley, the hilly ground recommences, at some distance from the sea, and forms the fortified Western Heights, to which access is gained from the town of Dover by a spiral staircase of two hundred steps, called the Military Shaft. From these heights the hilly ground approaches nearer and nearer to the sea, till at length it again forms chalky cliffs washed by the sea. Shakspere’s Cliff is one of the many prominent elevations presented in the distance from thence to Folkestone.

When, eight or ten years ago, a project was set on foot for forming a railroad from London to the eastern part of Kent, many competing lines were proposed; one through the northern part of the county, one through the midland district, and one approaching more nearly to the Sussex coast. But none of these could reach Dover without perforations of some kind through the cliffs by which the town is bounded on the land side. Into the history of the parliamentary discussion carried on by the advocates of the competing lines, we will not enter, suffice it to say that, eight or six years ago the South-Eastern Railway was determined on: proceeding from London on part of the London and Brighton line, thence eastward through a flat district known as the Weald of Kent, and lastly through and among and around the cliffs separating Folkestone from Dover, a heavy weight was required to bring about the necessary perforations in these cliffs, in order to bring the terminus of the railway as close as possible to Dover Harbour; and thus it happened that Shakspere’s Cliff became one of those included in the operations.

All the perforations intended to be made through the cliff are, we believe, now nearly completed, and we can fairly judge of the general effect. A few miles beyond Folkestone, will pass through a cliff near the sea by a tunnel upwards of a mile in length; it will then emerge, and pass for a mile and a quarter quite close to the sea, having stupendous cliffs bounding it on one hand, and the sea beneath it on the other; a situation the most striking and beautiful perhaps that any of our railways present. The tunnel will then pass through the Shakspere Cliff by a double tunnel, three-quarters of a mile in length, and, on its emergence, will be continued on an embankment or artificial beach at the sea-side, to a point very near Dover Harbour.

By a double tunnel through Shakspere’s Cliff, we mean a tunnel arranged on the principle of the vertical shaft. Therein, one archway being devoted to carriages proceeding from east to west, and the other for those passing from west to east. These parallel arches or tunnels are neither circular nor elliptical, as usually constructed, but pointed Gothic, each arch being thirty feet high by twelve wide. At certain intervals there are lateral communications from one archway to the other. From the level of the tunnels to the summit of the cliff seven vertical shafts ascend, about six feet in diameter, and varying from about a hundred and sixty to two hundred feet high; each arch descending to one of the lateral communications from tunnel to tunnel. From the tunnels, and at right angles to their length, are seven horizontal shafts or galleries, opening out to the very face of the cliff: they are about six feet wide and seven high, and descend by a slight inclination to the face of the cliff, the distance being probably from four to six hundred feet. We are not aware that any other railroad tunnels present this singular feature of horizontal galleries at right angles to their length; nor, indeed, are there many districts where such could be procured. The object of these lateral galleries is twofold. In the first place they have furnished a convenient means whereby the chalk and rock excavated from the tunnels could be precipitated into the sea; and in the next place they will aid in producing a more complete ventilation of the tunnels than vertical shafts alone could afford; for in summer the air within all these tunnels, being colder and heavier than that without, can scarcely ascend vertical shafts, whereas it can easily pass along these horizontal galleries to the sea. In making these various perforations the seven vertical shafts were sunk first, then the seven horizontal galleries proceeding thence to the sea-face of the cliff, and lastly the two tunnels themselves, parallel to each other and to the sea, and at an average distance from the sea of about four or five hundred feet.

A few hours spent at Dover would enable a stranger to the adjacent cliffs much here described. To reach that end of the tunnel nearest to Dover, the face of the cliffs a little eastward of the entrance may be descended by steps cut in the chalky precipice; but a less difficult and dangerous path may be obtained along the beach from the streets of Dover near the fort. On the beach from the fort to the tunnel, a platform or embankment will be formed, which will be of the same height as the walls of the tunnel, and at the end of the fortifications the same. Along the line of the tunnel are to be seen the upper faces of the seven shafts, all in a direct line, and projecting about eight or ten feet above the surface of the ground. From the line of these shafts a short ascent towards the south brings us to the very edge of the cliff, where,
although we cannot now see the "sapphire" gatherer hanging in mid air, we may yet obtain a grand and beautiful prospect. A walk of about three-quarters of a mile along the edge of the cliff terminates at a hollow which separates Shakspere's Cliff from another cliff westward of it, and where, by descending a somewhat dangerous series of stairs or steps cut in the face of the chalk rock, we may reach the western end of the tunnel. Beyond this point the sea-wall and roadway along the base of the cliffs involve works of great magnitude, and will not be finished for many months. Still farther westward may be seen the entrance of another tunnel, longer than the former, and not yet in a forward state.

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[July 30, 1843]

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THE TALEGALLA.

[Abridged from the 'Penny Cyclopædia.]

The Talegalla are a species of Australian birds of the genus Megapodiine, of which little has been correctly known till within a recent period. They had been considered as related to the family of vultures. Indeed Swainson has said:—"In fact, the feet of the two birds are formed nearly on the same principle; but, then, so are those of Orthonyr, a little scansional bird not much bigger than a robin. All three genera (of the Megapodiine), in short, are remarkable for their large disproportionate feet, long and slightly curved claws, and the equality of length, or nearly so, of the outer and the middle toe. It is by instances such as these that we perceive the full extent of those unnatural combinations which result from founding our notions of classifications from one set of characters, and forgetting to look at the full consequences of carry those notions into extended operation. Nor is this the only peculiarity of the New Holland vulture; for, unlike all others of its family, it possesses eighteen feathers in its tail. An examination of the bill," Mr. Swainson gives a cut of it, "which is decidedly raptorial, joined with many other considerations, shows that these are but analogical relations to the Rasores, while the real affinities of the bird lie in the circle of the Vulturideæ, of which it forms the rasorial type."

Mr. Gould, to whom we are indebted for a full and satisfactory account of the habits of this extraordinary bird, to which we shall presently advert, modestly says:—"After all the facts that have been stated, I trust it will be evident that its natural situation is among the Rasores, while that it forms one of a family of birds peculiar to Australia and the Indian Islands, of which Megapodius forms a part; and in confirmation of this view I may add, that the sternum has the two deep emarginations so truly characteristic of the Gallinaceæ; at all events it is in no way allied to the Vulturideæ, and is nearly as far removed from them as the turkey in Australia.

The adult male has the whole of the upper surface, wings, and tail, of a blackish-brown; the feathers of the under surface blackish-brown at the base, becoming silvery-grey at the tip; skin of the head and neck deep pink-red, thinly sprinkled with short hair-like feathers: the side and under surface bright yellow, tinged with red where it unites with the red of the neck; bill black; irides and feet brown.

The female is about a fourth less than the male in size, but so closely the same in colour as to render a separate description unnecessary. She also possesses the wattle, but not to so great an extent. (Gould.)

Mr. Gould describes Talegalla Lathamii, or the Wattled Talegalla, as a gregarious bird, generally moving about in small companies, much after the manner of the Gallinaceæ, and, like some species of that tribe, as very shy and distrustful. When it is disturbed, he states that it readily eludes pursuit by the facility with which it runs through the tangled brush. If hard pressed, or where rushed upon by their great enemy, the native dog, the whole company spring up on the lowermost bough of some neighbouring tree, and, by a succession of leaps from branch to branch, ascend to the top, and either perch there or fly off to another part of the brush. They resort also to the branches of trees as a shelter from the sun in the middle of the day, a habit which Mr. Gould notices as greatly tending to their destruction; for the sportsman is enabled to take a sure aim, and the birds, like the ruffed grouse of America, will allow a succession of shots to be fired till they are all brought down.

But the most remarkable circumstance connected with the economy of this bird is its nidification, for it does not hatch its eggs by incubation. It collects together a great heap of decaying vegetables as the place of deposit of its eggs, thus making a hot-bed, arising from the decomposition of the collected matter, by the heat of which the young are hatched. Mr. Gould describes this heap as the result of several weeks' collection by the birds previous to the period of laying, as varying in quantity from two to four cartloads, and as of a perfectly pyramidal form. This mound, he states, is composed of birds, but is the result of the united labour of many: the same site appeared to Mr. Gould to be resorted to for several years in succession, from the great size and entire decomposition of the lower part, the birds adding a fresh supply of materials on each occasion previous to laying.

"The mode," says Mr. Gould in continuation, "in which the materials composing these mounds are accumulated is equally singular, the bird never using its bill, but always grasping a quantity in its foot, throwing it backwards to one common centre, and thus clearing the surface of the ground for a considerable distance so completely, that scarcely a leaf or a blade of grass is left, and where they have been accumulated and time allowed for a sufficient heat to be engendered, the eggs are deposited, not side by side, as is ordinarily the case, but planted at the distance of nine or twelve inches from each other, and buried at nearly an arm's depth, perfectly upright, with the large end upwards: they are covered up as they are laid, and allowed to remain until hatched. The young ones are thus accumulated both by natives and settlers living near their haunts, that it is not an unusual event to obtain nearly a bushel of eggs at one time from a single heap; and as they are delicious eating, they are eagerly sought after.
Some of the natives state that the females are constantly in the neighbourhood of the heap about the time the young are likely to be hatched, and frequently uncover and cover them up again, apparently for the purpose of assisting them in their deposition; which has informed me that the eggs are merely deposited, and the young allowed to force their way unassisted.

In all probability, as nature has adopted this mode of reproduction, she has also furnished the tender birds with the power of sustaining themselves from the earliest period; and the great size of the egg would equally lead to this conclusion, since in so large a space it is reasonable to suppose that the bird would be much more developed than is usually found in eggs of smaller dimensions. In further confirmation of this point, I may add, that in searching for eggs in one of the mounds, I discovered the remains of a young bird, apparently just excluded from the shell, and which was clothed with feathers, not with down, as is usually the case: it is to be hoped that those who are resident in Australia, in situations favourable for investigating the subject, will direct their attention to the further elucidation of these interesting points. The upright position of the eggs tends to strengthen the opinion that they are never disturbed after being deposited, as it is consistent with the eggs deposited by birds which are hatched horizontally are frequently turned during incubation. Although, unfortunately, I was almost too late for the breeding-season, I nevertheless saw several of the heaps, both in the interior and at Illawarra: in every instance they were placed in the most retired and shady glens, and on the slope of a hill, the part above the nest being left uncovered, while all below remained untouched, as if the birds had found it more easy to convey the materials down than to throw them up. In one instance only was I fortunate enough to find a perfect egg, although the shells of many from which the young had been excluded were placed in the manner I have described. At Illawarra they were rather deposited in the light vegetable mould than among the leaves, which formed a considerable heap above them. The eggs are perfectly white, of a long, oval form, three inches and three-quarters long by two inches and a half in diameter. (Birds of Australia.)

The same author relates that these birds, while stalk- ing about the wood, frequently utter a loud clucking noise; and, in various parts of the bush, he observed depressions in the earth, which the natives informed him were made by the birds in dusting themselves. The stomach is stated by Mr. Gould to be extremely muscular; and he found the crop of one which he dissected filled with seeds, berries, and a few insects.

Mr. Gould states that the extent of the range of this species over Australia is not yet satisfactorily ascertained. It is known he says, to inhabit various parts of New South Wales from Cape Howe on the south to Moreton Bay on the north; but the cedar-cutters and others, who so frequently hunt through the bushes of Illawarra and Maitland, have nearly exterminated it from those localities, and it is now most plentiful in the dense and little-trodden brushes of the Manning and Clarence. Mr. Gould was at first led to believe that the country between the mountain-ranges and the coast constituted its sole habitat; but he was agreeably surprised to find it inhabiting the scrubby gullies and sides of the lower hills that branch off from the great range on either side. He procured specimens at the Brezi range to the north of Liverpool Plains, and ascertained that it was abundant in all the hills on either side of the Namoi. (Ibid.)

In the Leipoa the bill is nearly as long as the head, slender, tumescent at the base, the edges undulated and incurved at the base, the nostrils ample, oblong, covered with an operculum, and placed in a central hollow. Head subcrested. Wings ample, rounded, concave; fifth primary quill the longest; the tertiaries nearly as long as the primaries. Tail rounded, tail-feathers fourteen. Tarsi moderate, robust, covered without anteriorly, and posteriorly with scales which are rounded and unequal. Toes rather short; lateral toes nearly equal. (Gould.) Head and crest blackish-brown; neck and shoulders dark ash-grey; the forepart of the neck from the chin to the breast marked by a series of lanceolate feathers, which are black with a white stripe down the centre; back and wings conspicuously marked with three distinct bands of greyish white, brown and black near the tip of each feather, the marks assuming an ocellated form, particularly on the tips of the secondaries; primaries brown, their outer webs marked with two or three zigzag lines near their tip; all the under surface light buff, the tips of the flank feathers barred with black; tail blackish-brown, broadly tipped with buff; bill black; feet blackish-brown. (Gould.)

In size this beautiful bird is inferior to Talegalla Lathami, and it is more slender and more elegantly formed.

Mr. Gould, in his ' Birds of Australia,' gives an account collected by Mr. John Gilbert, from G. Moore, Esq., advocate-general, Mr. Armstrong, the aboriginal interpreter, and some of the more intelligent natives of Western Australia. The Ocellated Leipoa is there described as a ground-bird, never taking to a tree except when closely hunted; when hard pursued it will frequently run its head into a bush, and is then easily taken. Food generally consisting of seeds and berries. The note mournful, very like that of a pigeon, but with a more inward tone. Eggs deposited in a mound of sand, the formation of which is the work of both sexes. According to the natives, the birds scratch up the sand for many yards around, forming a mound about three feet in height, the inside of which is constructed of alternate layers of dried leaves, grasses, &c., among which twelve eggs and upwards are deposited, and are covered up by the birds as they are laid; or, as the natives express it, "the countenances of the eggs are never visible." Upon these eggs the bird never sits, but when she has laid out her lay, as the henwives say, the whole are covered up, when the mound of sand resembles an ant's nest. The eggs, which are white, very slightly tinged with red, and about the size of a common fowl's egg, are hatched by the heat of the sun's rays, the vegetable lining retaining sufficient warmth during the night; they are deposited in layers, no two eggs being suffered to lie without a division. The natives, who are
very fond of the eggs, rob these hillocks two or three times in a season; and they judge of the number of eggs in a mound by the quantity of feathers lying about the hillock. The nest is a large heap of sand, and then they immediately open and take the whole. The bird will then begin to lay again, again to be robbed, and will frequently lay a third time. Upon questioning one of the men attached to Mr. Moore's expedition, he gave to Mr. Gilbert a similar account of its habits and mode of incubating; adding, that in all his colonies he observed the same result; that the eggs were lost on the sand; but that he never saw any of them cast-iron, upon which the superstructure was hard and firm when the water is off, but the moment to be afterwards built. The iron masses were to be

It would be so wholly swallowed up by the quicksands, because opposite them the most open and exposed part of the

of the water which covered with water, that it has been asserted if a sea. No large masses of timber were to be used; and the angles of the structure were to be so placed as to be opposite the most open and exposed parts of the

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RECENT IMPROVEMENTS IN LIGHT-HOUSES.

Among the lighthouses and sea-beacons projected and partially executed within the last few years, those for the Goodwin Sands deserve attention from the novel features which they present.

It may not be amiss to point out the locality and the nature of the Goodwin Sands, as a means of showing the importance of sea-lights in that quarter. Nearly opposite Deal is the commodious roadstead or anchorage called the "Downs," where ships are accustomed to assemble before proceeding on a voyage. It is about eight miles in length and six in width, and separates the mainland from the "Goodwin Sands," a dangerous shoal ten miles in length by two in breadth. The sands become partially uncovered at low-water; the material is soft, porous, and tenacious; they become hard and firm when the water is off, but the moment the tide begins to cover them they are again soft, and shift to and fro with the waves, occasioning a redness of the water which is plainly discernible from the town of Deal and the neighbouring shore. Such indeed is the shifting and loose state of the sands when slightly covered with water, that it has been asserted if a ship of the largest size were to strike on the Goodwin, it would be so wholly swallowed up by the quicksands, that in a few days no vestige of it would remain to be seen. Many millions of property have been lost on these sands, and probably thousands of lives. These dangers have been calculated to give great stability, as in the latter part of the last century to direct their attention to the practicability of erecting a lighthouse on the sands. With this view they sent several experienced engineers to investigate the matter, but the report was unfavourable and the plan abandoned. A floating-light or light-ship was the only safeguard practically adopted.

Within the last two or three years, however, two plans have been suggested and partially acted on, viz., the safety-beacon of Captain Bullock, and the fixed lighthouse of Mr. Bush. The beacon was finished during the year 1840, and consists of a column about forty feet above the level of the sea, surrounded by a platform ten feet high, the base of which is large enough to hold forty persons round the top of the column, made of sail-cloth, access to which is obtained by ropes and 'cleats' or notches in the side of the column. A barrel of fresh water, together with a painted bag enclosing a flag of distress, is stationed on the gallery; and the words 'Hoist the flag,' painted on a great number of languages, on boards placed round the inner part of the gallery; and the beacon is capable of containing at least forty persons round the top of the column, made of sail-cloth, access to which is obtained by ropes and 'cleats' or notches in the side of the column. A barrel of fresh water, together with a painted bag enclosing a flag of distress, is stationed on the gallery; and the words 'Hoist the flag,' painted on a great number of languages, on boards placed round the inner part of the gallery; and the beam is capable of containing at least forty persons round the top of the column, made of sail-cloth, access to which is obtained by ropes and 'cleats' or notches in the side of the column.
horizon. In connection with the platform at the top, it was conceived, be provided a light, a boat, a gun, a bell, a flag-staff, and other requisites for distressed seamen who might be shipwrecked on the Goodwin Sands. Nothing, as far as we are aware, has been done in furtherance of this plan by Lieutenant Worthington.

Attention is first paid to Captain Bullock's beacon on the Godwin, which, it will be understood, is only a place of refuge, plans are in progress for building a permanent lighthouse on the sands. In the year 1836 Mr. Bush, civil engineer, submitted to a committee of the House of Commons on shipwrecks, a very singular plan, of which the following is an outline: — He proposed to build, on land, a wooden truncated cone, one hundred feet high, sixty feet diameter at the bottom, and twenty feet at the top. Around this was to be built another, touching it at the lower extremity, but receding from it upwards; and this intervening space was to be filled with sand or other materials to such a degree as to cause the whole to sink into the sea. It was to be sunk to such a depth as to have the top of it level with the highest tides; the cone was then to be drawn out from the inner cone, and its place supplied with masonry or concrete. This was to form a solid foundation, whereon was to be erected a cast-iron lighthouse one hundred feet high; so that the whole structure would be two hundred feet from the base of the cone to the top of the lantern. When this was completely full, the masonry was only intended to facilitate the adjustment of the inner one, was to be removed. The cone, when filled in with granite, was estimated as likely to weigh about nine thousand tons.

Such was the plan submitted to the Trinity House, and to the committee of the House of Commons, about six years ago; it has been adopted in an altered form. The journals during the past year have contained many notices of Mr. Bush's present project, which may be shortly described as follows: — At the Thorncliffe iron-works, near Rotherham, in Yorkshire, has been cast an immense cylindrical caisson, or hollow case, sixty-four feet in height and thirty in diameter. This is to be sunk in the sands, and to form a base, consisting of a column eighty-six feet in height, and a light-room and surmounting statue rising forty feet more. The weight of the lower shaft alone is estimated at a hundred and twenty tons. In the main shaft or column there is to be a cell large enough to hold one hundred men, with provisions, storehouses, magazines, &c. The caisson or lower shaft was to have been floated out to the sands, preparatory to being sunk, last autumn; but circumstances occurred which rendered a postponement necessary till the present year. We believe that the sinking of the caisson has not yet actually taken place.

The details given in the last paper, coupled with those here presented, will show that two totally different plans are in agitation for the erection of lighthouses on a loose sandy foundation; the one being the insertion of screw-piles into the sand, as a foundation for a superstructure, and the other being the sinking of a heavy hollow case as a foundation. The experience of future years must show which of these methods possesses the larger share of advantages; the least expensive will in all probability be the screw-pile method.

Not the least curious among the lighthouse operations exhibited within the last two or three years, is the absolute removal of an entire lighthouse from one spot to another, without the disruption or injury of any of its parts.*

* This fact was alluded to in our recent pages on the 'American Method of moving Houses.'

In the year 1803 a lighthouse was built by the late Mr. Pickernell on the northern pier at Sunderland. It is wholly composed of stone; its form is octagonal, fifteen feet in breadth across its base, nine feet across at the top, and about eighty feet high to the summit. During the month of May last year, a plan was under the consideration of the commissioners of the river Wear, to pull down this lighthouse, and to re-erect it on the eastern extremity of the pier, a spot distant five hundred feet from the former locality. Mr. Murray, however, a civil engineer, conceived the practicability of removing the entire lighthouse this distance without destroying or endangering it. He submitted the following plan: — "The masonry was to be cut through near its foundation, and while timbers were to be inserted, one after another, through the building, and extending seven feet beyond it. Above and at right angles to them, another tier of timber was to be inserted in like manner, so as to make the cradle or base a square of twenty feet; which cradle was to be supported upon bearers, with about two hundred and fifty wheels of six inches diameter, and was to traverse on the grooves of the railway track. That part of the masonry laid parallel to the line of the screw, was to be levelled off, and a steady light, of more or less magnitude, be inserted by as many reflectors, as required at each point. Theshaft of the lighthouse was to be tied together with bands, and its eight sides supported with timber braces from the cradle upwards to the cornice. The cradle was to be drawn and pushed forward by powerful screws along the railway, on the principle of Morton's patent slip for repairing vessels. This was the plan properly, and was acted on throughout, with the exception of a windlass and rope, worked by thirty men, being substituted for screws. By making openings transversely through the masonry near the bottom, and by inserting stout timbers through them, the structure acquired by degrees an artificial bottom formed of timber; and this timber flooring being joined to the masonry, the latter was thus put into a square form, and raised above the level of the pier. The means of transporting the bulky burden to its new position was to be removed. The cradle, so constructed, was to be readily transported from one place to another, and the timbers removed, one after another, after the light had been thus placed in its new locality. This was done in furtherance of this plan by Lieutenant Morton's patents for repairing vessels.'

A suggestion was made about two years ago by Captain Basil Hall, in a letter addressed to the United Service Journal, which may hereafter be of importance in reference to the management of the lights in lighthouses. In order to render his meaning clear, he drew attention to the varieties observed in light houses, according to the precise purpose of each. If a lighthouse were required to be viewed from one point only, a fixed bright light visible in that direction would be all that was necessary; but if circumstances require the light to be seen from every point of the horizon. Thus the Eddystone, the Scilly, the Bell Rock, and many other lighthouses must be rendered equally visible from whatever quarter they may be viewed; for if any point be left out, a ship sailing in that direction would be left without a guide. In the case first mentioned the matter is of no consequence to be illuminated. Even this does not remove the evil, for the effect of a parabolic reflector is to send out the rays of light in one direction only; so that if we had twenty-four lamps in a circle, although they would light twenty-four different parts of the horizon, yet there would be twenty-four dark portions alternating with those which are illuminated. This difficulty, as well as the diminution of the light when the lamps were so scattered, has led to the plan
of revolving lights. Captain Hall supposes as an illustrious instance, that we have twenty-four lamps in the lighthouse, ranged not equidistant round every point of the horizon, but six directed by means of their reflectors due north, six due south, six east, and six west; thereby presenting a brilliant flood of light in those four directions. He then proceeds:—

"If that part of the lighthouse upon which the four sets of lamps are fixed be turned six times as it revolves on a vertical axis, the four concentrated beams of light cast from the different sets of lamps, instead of illuminating only the four cardinal points of the compass, will now light up, in succession, every part of the whole circuit of the horizon. Of course every ship, however situated with respect to the lighthouse, will, in her turn be favoured with a brilliant though transient blaze of light, six times greater in splendour than she could have received from the fixed light first described."

Such a light as the one here described is called a "revolving" light, of which there are about twenty-five among the two hundred lighthouses on and around the British Islands. Captain Hall then explains why these lights are employed more frequently; because it is necessary that two lights, comparatively near each other, should be of different character, in order that mariners may not confound one with the other at night. This difficulty is exemplified by alluding to the dangers which may accrue if the lighthouses at Scilly and at the Land's End both had revolving lights; as it is, the corn of these latter is burned, and the latter fixed; and although the latter is much inferior to the former, yet it is better than another revolving light would be at that spot, on account of the liability of mistakes in such a case. Captain Hall's suggestion is, that a fixed light, or rather a single light, should be made to rotate on its axis with such rapidity as to exhibit a line of light all along its path; as is done by the principle of a burning stick whirled rapidly round in a circle. If this could be accomplished, the resulting light would be contiguous in every direction, and not intermitting, as a "revolving" light of the usual kind necessarily must be. Captain Hall does not enter into the mechanical difficulties of the matter; but throws out the suggestion for the consideration of engineers generally; expressing a conviction, in the form of vapour.

To preserve Flowers fresh.—It is now, alas! a long eighteen years since we first saw, in the drawing-room of a gentleman now no more, in the hot, dry weather of the dog-days, flowers preserved day after day in all their freshness by the following simple contrivance:—A flat dish of porcelain had water poured into it. In the water a vase of flowers was set; over the whole a bell-glass was placed with its rim in the water. This was a Ward's case in principle, although different in its construction. The air that surrounded the flowers, being confined beneath the bell-glass, was constantly moist with the water that rose into it in the form of vapour. As fast as the water was condensed it ran down the sides of the bell-glass back into the dish; and, if means had been taken to enclose the water on the outside of the glass, so as to prevent its evaporating into the air of the sitting-room, the atmosphere around the flowers would have remained continually damp. What is the explanation of this? Do the flowers feed on the viewless vapour that surrounds them? Perhaps they do; but the great cause of their preserving their freshness is to be sought in another fact. When flowers are brought into a sitting-room they fade, because of the dryness of the air. The air of a sitting-room is usually something drier than that of the garden, and always much more so than that of a good green-house or store. Flowers when gathered are cut off from the supply of moisture collected for them by their roots, and their mutilated stems are far from having so great a power of suckling up fluids as the roots have. If, then, with diminished powers of feeding they are exposed to augmented perspiration, as is the case in a dry sitting-room, it is evident that the balance of gain on the one hand by the roots, and loss on the other by their whole surface, cannot be maintained. The result can only be their destruction. Now, to place them in a damp atmosphere is to restore this balance; because, if their power of sucking is diminished, so is their power of perspiring; for a damp atmosphere will rob them of water. Hence they maintain their freshness. The only difference between plants in a Ward's case and in the little apparatus just described is this—that the former is intended for a whole house, while the latter is merely for their preservation for a few days only. When the air which surrounds the flowers is always charged with the same quantity of vapour, but will vary with the circumstances, and at the will of him who has the management of it. We recom-
A DAY AT A DISTILLERY.

THE PENNY MAGAZINE.

No. 663.

Messes. Smith and Co.'s Distillery, Thames Bank.

The subject of the present Supplement takes us up the river to the vicinity of Chelsea. Let us, then, get on board one of the little river-steamers, and proceed in that direction.

After passing Vauxhall Bridge, we stop for a few moments as everybody now knows—at the Nine-Elms pier, and thence proceed onward towards the termination of the route at Chelsea. On the left we pass the South London Water-works, as well as factories, warehouses, and wharfs of different kinds; and then arrive at the river-side house so well known to all amateur boatmen as the 'Red House.' On the right, after passing a gas-factory, we see the noble manufacturing premises of Messrs. Cubitt, the builders, with the chimney inclosed in a decorated square tower. Then we come to the London Steel-works; beyond which is the Belgrave Dock; and westward of both are two tall chimneys, one of which points out the Chelsea Water-works, and the other the distillery of Messrs. Octavius Smith and Co., the establishment to which our attention is here directed. This latter-named chimney is conspicuous from the river on account of its proportions; the celebrated obelisk called 'Cleopatra's Needle' having been taken as a model in its construction. The river-front of this factory presents to view a dock, whereinto barges laden with corn and coals for the factory are conveyed to be unloaded.

The entrance to the distillery is on the eastern side, and on entering the outer gates we find ourselves in an irregularly-shaped open court, surrounded by buildings, of which several are seen in the frontispiece. On the left are large granaries, where the grain, after being hoisted from barges in the dock, is stored. Beyond these we see various buildings connected with the still-room, comprising a cylindrical worm-tub of very large dimensions, water-tanks and cooling-tanks at a considerable elevation, store-warehouses, &c. In front are the offices and counting-houses; bounded on the right by various workshops for smiths, millwrights, coppersmiths, carpenters, and others engaged in the repair and adjustment of the apparatus used in the distillery. On the right of the entrance, and extending to a considerable distance northward, are the mill and the brewhouse, wherein all those operations are conducted which precede the actual distillation. Stables and other outhouses occupy other parts of the area; while the open court presents a busy scene of traffic: here waggons being laden with casks about to leave the distillery; at another spot yeast being brought in from the great London breweries; at a third, 'grains' being carted for conveyance to the dairies; and at a fourth, men filling barrels with 'spent-wash,' to be carried away as a fattening ingredient for cattle and pigs.

Before describing the operations of this establishment, which we have been permitted to do by the liberality of the proprietors, it may be well to explain briefly what is meant by the terms 'distillation' and 'distillery.' All kinds of grain, such as wheat, rye,
barley, oats, &c., whether in the raw or the malted state, as well as the juices of fruits, of the sugar-cane, of potatoes, of beet-root, and of many other vegetable substances, contain certain elements which, by peculiar processes, are capable of being converted into alcohol or spirit. Distillation always forms one of these operations; but it is preceded by others which vary according to the nature of the ingredients employed. The various liquids known by the names of brandy, rum, whiskey, Hollands, gin, spirits of wine, cordials, and compounds, all contain the alcoholic principle, developed by the process of distillation. French brandy is produced from wine; West Indian rum from sugar or molasses; and British spirit, whether called by the name of spirit of wine, British brandy, British rum, whiskey, or gin, from corn. In every case the substance which undergoes the process of distillation is a sweet liquid; but the means whereby this sweetness or saccharine quality is brought about differ according to circumstances. The different qualities presented by these various liquids depend partly on the alcoholic strength, partly on the substances whence they are produced, partly on the berries, herbs, and seeds with which they are flavoured, and partly on the mode in which the manufacture is conducted.

We are prepared to understand, then, that the operations of a British distillery relate to the extraction of the alcoholic principle from various kinds of grain. We must next bear in mind, that the extract produced from this grain is brewed before being distilled: it is in fact converted into a kind of beer before that change is produced which leads to the production of spirit. Hence it follows that many of the operations of a distillery resemble those of a brewery. The brewer and the distiller alike extract a saccharine substance from grain (principally malted in respect to brewing, but more generally raw for distilling), by the process of 'mashing'; and alike subject this sweet liquid, called 'worts,' to fermentation. The fermented liquor, modified in a particular way, forms 'beer' at the brewery; whereas in a distillery it obtains the name of 'wash,' and is the liquid which undergoes the subsequent process of distillation.

The staple ingredient, then, at the distillery, is grain, and this is brought into the establishment to which our attention will be now directed in barges belonging to the firm. These barges are laden from the vessels which bring the grain from various ports, the grain being brought in sacks containing four bushels each. The dock is contrived so judiciously that the barges can float in at high-water, and pass immediately under the granary, into which the sacks are hoisted from the barge by means of tackle of the usual kind. The granary is a large brick building, having three extensive floors, on which the grain is stored. Malt is barley which has undergone, on the premises of the maltster, a process calculated to render it more fitted for the purposes of the brewer than barley or other grain in the raw or unmalted state; but the distiller can employ either raw or malted grain according to circumstances. Malt being much more expensive on account of the duty, than raw grain, the distiller usually employs as little of the former as the nature of the process requires. The proportion is now frequently one part of malt to ten or twelve of raw grain; the raw grain being varying mixtures of wheat, barley, rye, and oats, according to the state of the market; but more than half of the entire ingredients is generally raw barley.

On one of the granary floors we saw a heap of about two thousand quarters of kiln-dried barley, lying in a stratum five feet thick, and waiting to be conveyed to the mill. All the grain required at the distillery, about forty thousand quarters per annum, passes thus through the granary; and when about to be ground into meal, it is conveyed to a room immediately over the mill-room, and discharged through trap-doors in the floor into cloth pipes, which conduct it to the millstones. To the mill-room we next descend; where we see six pairs of mill-stones, ranged in a circle, and set in motion by a shaft from the steam-engine rising up in the centre of the group. These six pairs of stones, kept wholly or partially at work according to circumstances, grind all the raw grain; while the malt is passed through a 'crushing-mill,' consisting mainly of two rollers placed nearly in contact. The object of this difference is, that the distiller requires to crush the malt, instead of grinding it; the internal substance being by this means softened or disintegrated without cutting the husk, a precaution which is not found necessary in the case of raw grain.

A visitor must expect to leave this mill-room as white as a miller; nor is he less plentifully sprinkled with meal when he descends to the room beneath. This lower room contains a vertical cylindrical partition, having within it the mechanism whereby the millstones are rotated in the room above. And around

[Gran-mill and Meal-sacks.]
it pipes or openings, through which the ground meal descends from the mills. The mill-men fasten sacks to these openings, and thus receive the meal as it descends heated to a temperature of perhaps 100° by the friction of the stones. The preceding cut represents the general nature of the operations in both these floors of the mill: the upper division showing the operation of the millstones in the room above; and the lower showing the reception of the ground meal in the room beneath.

We next trace the meal, thus ground, to the brewhouse, through a gallery or covered way, leading from the south to the north department of the establishment. In this brewhouse are three large copper vessels, each provided with a fireplace underneath, and the whole capable of containing about fifty thousand gallons; these are for the purpose of heating the water where the brewing process is effected. The most important vessels in the brewhouse are the 'mash-tuns,' two in number: these are cast-iron circular vessels, upwards of twenty feet in diameter, and each capable of containing twenty thousand gallons; each is provided with a double bottom, one above the other, having a small vacancy between them, and the upper one being pierced with small holes an inch or two apart. From the middle of each tun rises a vertical shaft, set in motion by a steam-engine, and acting upon horizontal arms, studded with spikes or pins on all sides: this apparatus, by rotating both horizontally and vertically, effectually stirs and agitates any ingredients which may be in the tun.

All being ready for the brewing, hot water is admitted to the 'mash-tuns' by pipes leading from the copper; while ground meal is thrown in at the top of each tun. The sacks of ground meal are stored in the mill adjoining the brewhouse, and are from thence wheeled to the tun on low hand-carriages. This is a very bustling scene when a 'mashing' is about to commence, ten or a dozen men being employed to wheel in the sacks, discharge the meal, and return for another cargo. We may here remark that the water is conveyed to the copper vessels from a very large cast-iron tank, or 'liquor-back,' on another part of the premises: it is pumped into this tank from a reservoir sunk below the level of the ground in the north-west parts; the reservoir being supplied by a pipe leading from the Thames at a point within the limits of low-water; so that a constant supply of water is thus obtained.

The crushed malt, the ground grain, and the hot water, being admitted into the tuns in the requisite proportions, the rotating stirrer or 'mashing-machine' is put into action, whereby the solid and liquid ingredients are so completely mixed up together, that the water is enabled to extract the saccharine elements from the meal. Men are also employed with long-handled instruments to stir the sediment, which might otherwise remain at the bottom; and a scene is then presented such as is shown in the cut at the top of the next page. These operations continue for two or three hours, during which a striking chemical change has been going on. Meal consists principally of gluten and starch; and by the agency of water and a sufficient temperature this starch becomes converted into sugar.

The precise explanation of this change involves chemical niceties into which we need not enter; but it will be sufficient to say, that the water, converted into 'worts' by the process of mashing, acquires a sweet though sickly taste, arising from the starch of the meal having been converted into sugar.

When the 'mashing' has been continued to a certain extent, five or six pipes are opened, through which the 'worts' are allowed to flow into cast-iron cisterns called 'under-backs,' in a cellar beneath. The meal is retained by the upper or false bottom of the mash-tun, which thus acts as a sieve or strainer, allowing nothing but liquid to pass through the perforations.

The meal does not lose all its saccharine quality by this first mashing: it is therefore 'mashed' a second and a third time, in fresh portions of water; producing 'worts' of less and less strength. As to the number of times that the mashing is repeated, the quantity of water used for a given weight of meal at each mashing, the temperature of the water, and the length of time during which the mashing is continued—these are points on which each individual manufacturer exercises his skill and judgment, and may possibly vary considerably in different establishments. When the saccharine qualities of the meal are as far as possible extracted, the residue, under the name of 'grains,' is carried out to the grain-stage, in the yard of the distillery, thence to be sold as food for cattle.

From the under-backs, the 'worts' are pumped up to the coolers or cooling-floors, occupying the upper portion of a building contiguous to the brewhouse on the north. These floors are covered or paved with cast-iron plates, three or four feet square, and joined edge to edge; raised ledges are placed across the floors at certain distances, to divide them into compartments; and into the shallow cells or trays thus formed the hot wort is introduced. The whole floor, upwards of a hundred and fifty feet in length, becomes thus covered with a stratum of hot liquor five or six inches deep; which is speedily cooled by the access of air from open windows on all sides of the coolers. Such a mode of cooling is very prevalently adopted in the large breweries and distilleries; though in some cases 'refrigerators' are employed, in which the hot wort passes through pipes exposed externally to a current of cold water. It is merely a question of expediency as to which method is employed; for the principle is the same in both cases, viz., the rapid abstraction of heat by a medium colder than the wort itself. In the adjoining cut we have represented one of these floors, covered with the hot liquid, and sup-
Sobahome of strength, the utmost caution is necessary in testing the strength of all the spirits produced, as a guarantee that all the spirit produced shall pay a duty exactly proportionate both to its quantity and its strength. As agents on the part of the government, there are excise-officers almost constantly present at every distillery, day and night. They succeed each other, one or more at a time as may be necessary, after intervals of eight hours; the periods being from six in the morning till two in the afternoon, from thence to ten at night, and from thence to six the next morning.

The act of parliament by which distilleries are now regulated was passed in 1825. By its provisions no distiller is allowed to commence operations till he has procured a licence, which licence is to be renewed annually; nor is he allowed to keep on his premises a still below a certain capacity. The number of stills, charges, receivers, &c. employed by him is also placed under certain restrictions; and the precise routine is marked out as to the mode in which the liquid shall pass from one vessel to another in the process of distillation. The number of openings in the principal vessels is expressly stated; and the most scrupulous care is taken that nothing shall pass from one vessel to another without flowing through a provided with a cock or valve of which the excise-officer has the key. He is provided with keys whereby he can lock up the furnace-doors, lock up the stills, and in fact exercise a most thorough control over all the operations. In order further to facilitate the supervision of the excise-officers, the brewing and the distillation take place in alternate periods. The time being appropriated to the preparation of 'wash,' or 'fermented wort,' in the brewery, and the next to distillation of spirit from the wash thus produced.

From the coolers the wort descends into the 'fermenting-backs,' a series of square vessels of enormous dimensions: they are sixteen in number, each about thirty feet long and half as wide, having an aggregate capacity of nearly half a million gallons. Here the liquid is exposed to the action of yeast, bought for that purpose of the great porter-brewers: the alcoholic fermentation ensues, whereby the sugar, which had been developed from the grain during the process of mashing, becomes converted into alcohol or spirit. This is one of the most delicate of all the operations, whether in a brewery or a distillery, requiring extensive knowledge both of the principles of chemistry and of practical results. The nature of the process may be briefly explained as follows:—The wort, in consequence of containing a considerable amount of saccharine matter in solution, is heavier than water; and the manufacturers express the degree of density by stating how many pounds heavier a barrel of wort is than a barrel of water. Whatever may be the strength of the wort actually obtained in any one mashing, the distiller is confined to certain limits when he transfers the mingled wort to the fermenting-tun; for he is obliged by law to bring the wort to a specific gravity somewhere between 1.050 and 1.090, water being 1.000. This specific gravity becomes gradually lessened in the fermenting-backs, by the gradual conversion of the sugar into alcohol; this latter-named liquid being very much lighter than water. The specific gravity is in fact brought down very near to that of distilled water, and the wort, now denominated 'wash,' may be considered as a mixture of alcohol and water, containing a small quantity of an essential oil, a little saccharine matter, and one or two other substances.

We now come to that part of the distiller's operations where it is desirable to speak of the relations between the manufacturer and the Excise. The system of supervision whereby the revenue in spirits is collected is a remarkable instance of Excise machinery: a supervision rendered important by the large revenue annually collected, and by the comparatively small number of establishments from which the payments are made. The single firm whose establishment forms the subject of our present notice pays no less a sum than 300,000l. a year to government in duty on the spirits manufactured; and as the duty per gallon is estimated on spirits of one particular degree
to observe that the pipes, of which a large quantity is visible, are painted of different colours; this illustrates another of the peculiar rules whereby the operations of a distillery are governed; for in order to facilitate the supervision of the officer, and to enable him to trace the routine of processes conveniently, the legislature requires that every pipe for the conveyance of water shall be painted black, those for the conveyance of 'wort' or 'wash' red, those for the product of the first distillation blue, and those for the finished spirit white. Another regulation is, that whatever may be the size and arrangement of the distillery, ladders and all other conveniences shall be provided for the easy access of the officer to all the different vessels.

The 'wash-charger,' into which the wash is conveyed from the fermenting-vessels, is a large iron tank or closed cistern capable of containing about thirty thousand gallons. By the express terms of the law, this vessel must be entirely closed in, and must communicate only with the fermenting-vessel and with the still, so that nothing can flow into it except from the former, and nothing flows out of it except into the latter, since the top or cover is a small hole, about an inch square, into which the officer dips a graduated rod; the object being to determine whether the quantity entering this vessel is the same as had been contained in the fermenting-backs. The officer keeps the key of the cocks or valves leading into and from this vessel, whereby not a single drop fall into the still until he has unlocked the requisite pipes. The annexed cut represents one of the two large wash-stills into which the wash flows from the wash-charger. This is a copper vessel capable of containing more than twenty thousand gallons. It is heated by a fire beneath, and is terminated at the top by a cover, which gradually decreases in diameter, and at length joins the 'worm,' of which we shall presently speak. The still is formed of plates of copper firmly riveted, and otherwise so contrived as to be air and water tight.

We must now consider briefly the nature of the process carried on in the large still. The 'wash' conveyed into it consists mainly of alcohol and water, in the proportion (generally) of about six gallons of pure alcohol, or twelve gallons of 'proof spirit,' in a hundred gallons of wash; 'proof spirit' being composed of about equal parts of alcohol and water. Water passes off in the form of vapour at a temperature of 212°; while alcohol does the same at the temperature of 180°; and the distiller avails himself of this circumstance to effect a separation of the two liquids. He applies fire to the still, by which the 'wash' is gradually heated; and when the temperature attains 180°, the alcohol begins to vaporise and to ascend to the top of the still. The heat is kept up to some point between the two extremes of 180° and 212°, until all the alcohol has passed off in the state of vapour. But during this process, partly on account of the restrictions imposed by the legislature, and partly through the scientific difficulties of the subject, a considerable quantity of water passes off with the spirit and mingles with it in the form of vapour. In France, where the operations of a distillery are not so rigidly controlled by the government as in England, improvements in great number have been from time to time introduced, with a view of effecting a complete separation of the two liquids in one operation: to what extent and under what limitations these attempts have succeeded, we will not discuss here; it will suffice to state that in England so much aqueous vapour passes over with the alcohol, as to render this latter comparatively weak. When all the alcoholic ingredient is distilled from the wash, the latter, under the name of 'spent wash,' is conveyed from the still to a large open vessel in the yard of the distillery. It is then carried away in barrels by persons who keep cattle or pigs: the dry food of these animals, being sprinkled with some of the spent wash, acquires a fattening quality, which gives a value to the liquid after it has ceased to possess any to the distiller.

But it may now be asked, what becomes of the alcoholic vapour driven off by the heat of the still? The answer to this question forms the next step in our routine of processes. In the frontispiece is seen a very large cylindrical vessel near the chimney. This is called the 'worm-tub,' and contains the means for condensing the vapour after it has ascended from the still. This large vessel, which is between thirty and forty feet in height, contains a worm, or coil of copper pipe, circling round it in a screw-like form from top to bottom. This pipe is not much less than two feet diameter where it enters the worm-tub, but gradually diminishes as it descends, till it leaves the vessel with a diameter of less than two inches. The vacant space of the worm-tub, not occupied by the pipe, is filled up with water, which is constantly flowing into a water-tank, or 'liquor-back,' at the top of the still-house, an overflow from the top being necessarily provided for. All the vapour which ascends from the still passes into and through this worm or coil of pipe, and in its passage becomes condensed into a liquid by the coldness of the water contained in the worm-tub. Whenever vapour is condensed into liquid, a large amount of latent heat is given out; and as this occurs during the condensation of the vapour in the worm, the water in the worm-tub becomes gradually heated, until at length its temperature would be such as to unfit it for the office of a refrigerator, were there not a constant supply of cold water flowing in, and an equal quantity of heated water flowing out. The rate of change is so regulated as to keep the water in the worm-tub at as low a temperature as possible. There is another arrangement of worm connected with one or two of the stills, although the principle is the same. We pass up through the still-house to the roof, and there find that a large area is occupied by tanks or 'liquor-cisterns,' through which cold water is constantly flowing from the reservoir. The pipe forming the worm coils round and round in these tanks, gradually parting with its heat to the
water by which it is surrounded, and thus condenses the spirituous vapour passing through the worm from the still. By an ingenious arrangement the water, when too hot for the purpose of condensation, is allowed to fall on the float-boards of a large water-wheel, which thus furnishes moving-power for some of the pumps in the still-house.

The liquid which flows out at the lower end of the worm is called, in the language of the distillery, 'low-wines': it is a very weak kind of spirit, containing all the alcohol previously existing in the 'wash,' mingled with a considerable quantity of water. As we shall now have to speak of the strength of spirit, it may be desirable to explain the nature of the standard employed by the Excise. Alcohol being of a lower specific gravity than water, a quart or any other quantity of the former would weigh less than an equal quantity of the latter; and any mixture of the two will weigh more or less according as the water or the alcohol predominates. The excise adopts as a standard that particular mixture of alcohol and water whose weight bears to that of an equal bulk of distilled water at a medium temperature the ratio of twelve to thirteen; that is, supposing a given bulk of distilled water weighed thirteen ounces, then an equal bulk of standard spirit will weigh twelve ounces. This particular degree of alcoholic strength is called 'proof spirit,' and is the standard to which all other strengths are referred: it consists almost exactly of one-half pure alcohol and one-half water. The strengths of all mixtures of alcohol and water—called by the popular name of spirits—are ascertained by means of their specific gravity, and this is determined by a hydrometer, of which that kind known as 'Sikes's Hydrometer' is used by the excise. This instrument is capable of weighing all liquids as light as the strongest spirit and as heavy as water, and consequently all mixtures of the two. The scale of the instrument is graduated, and these graduations are said to be 'above proof' or 'below proof,' according as they indicate a degree of strength above or below that of 'proof spirit.' '100° below proof' is equivalent to pure water, while '70° above proof' is about equivalent to the strongest spirit ever produced by distillation. When the strength exceeds '43° above proof,' the liquid is known by the name of spirits of wine, and constitutes the strongest form in which spirit is presented to us, except in the refined operations of the chemist's laboratory.

These explanations will enable us to allude to the strengths of spirits in the language of the distillery. We may proceed to state, then, that the 'low-wines' leave the worm of the wash-still at a strength very many degrees 'below proof,' in consequence of the large quantity of water mingled with the alcohol. The blue pipe which emerges from the worm-tub, and which contains the 'low-wines,' terminates in the curious piece of apparatus represented in the following cut. This apparatus is called the 'worm-safe,' and is intended to afford the means of testing the clearness and strength of the liquid flowing through it. The liquid flows from the end of the pipe into a hollow glass globe receiver, and from thence flows back through a larger pipe concentric with the former. By turning a small handle, a small portion of the liquid is made to pass into an upright cylindrical glass vessel two or three inches in diameter; and into this cylinder the hydrometer is introduced for measuring the strength of the liquid.

From the worm-safe the low-wines flow into vessels called 'low-wine receivers,' the stronger portion being allowed to flow into one receiver, and the weaker into another. These receivers, like all the other vessels employed in a distillery, are under the control of the excise-officer, who ascertains the quantity and the strength of the low-wines obtained by distillation. From the quantity and the specific gravity can be ascertained the amount of 'proof spirit' contained in the low-wines receiver, and this amount is entered as a check against the operations in other parts of the process.

The 'low-wines,' being much too weak for any of the ordinary purposes of spirit, have to be redistilled, as a means of driving off a considerable proportion of water. This redistillation is effected in other vessels called 'low-wine stills,' or sometimes 'spirit-stills.' But here some degree of complication occurs, of which we can only speak in a general way. Provided all the wash is distilled in the wash-still, and the product collected in the low-wine receivers, the excise allows the distiller a certain latitude as to the subsequent distillations in the spirit-still. He may redistil over and over again, with a view to improve the quality of his spirit, or to economize ingredients, provided the officer can retain throughout the means of determining that all the spirit obtained from the wash is ultimately collected in the spirit-receiver; and that none is so collected but what can be thus accounted for. This latitude seems to have been allowed to the distiller partly because a portion of the spirit, redistilled from the low-wines, possesses a disagreeable odour and flavour, which must by some means be removed, and which the distiller may devise the means for removing more effectually if allowed to exercise his judgment in the matter. These impure portions of the spirit, which are called 'feints,' and which derive their peculiar quality principally from a festid oil yielded by the husks of the grain, are collected in separate receivers, and are thence reconveyed to the spirit-still to be redistilled. At this point in the proceedings, therefore, each distiller is enabled to exercise his judgment, and apply the results of his experience in the management of his distillery: hence, too, arise the distinctions between strong and weak 'low-wines,' and strong and weak 'feints,' distinctions made to further the views of the distiller. It will be sufficient for our present purpose, however, to state generally, that one distillation in the wash-still con-
verts all the alcoholic portion of the wash into low-wines; and that one distillation in the spirit-still converts the greater part of the low-wines into spirits, the remaining portion requiring a third distillation.

We had occasion to speak of two different modes of condensing the vapour adopted at the distillery, and have now to speak of a third. The spirit-still is surmounted by a tall copper cylinder, the interior of which contains a number of small pipes; cold water is kept constantly flowing through these pipes, so adjusted to the heat of the cylinder as to maintain a pretty constant temperature of 180° or 190°. Now as the vapour rises from the still into the cylindrical condenser, and comes in contact with the inner pipes, the aqueous portion falls down again into the still in the form of water, being unable to maintain the vapidic form when in contact with substances at so low a temperature as 190°. But the alcoholic portion remains in the state of vapour at that temperature, and passes off into the worm of the still, to be condensed into spirit.

We have spoken only of one 'safe' for the exhibition and testing of the distilled product. But there are four such in the distillery to which our attention is directed: they are arranged two on either side of a central aisle, raised a few steps above the floor of the still-room, and are adapted to receive the various kinds of 'low-wines,' 'feints,' and 'spirits,' as they proceed from the condensing-worms to the respective receivers.

The spirit-receiver is a vessel under the especial supervision of the excise officers, since the final adjustment of proof is regulated by the quantity and strength of the contents of this receiver. We have before stated that the officer gauges the quantity and specific gravity of the worts in the fermenting-back, and calculates the quantity of proof spirit which ought to be charged for therein, amounting to twelve gallons of proof-spirit from one hundred gallons of wort when the latter has a specific gravity of 1:060. He also gauges the quantity and strength of the proof-spirit in the 'low-wines,' in the feints, and lastly in the finished spirits, with a view to let one method act as a check to the other. The duty is paid on the actual quantity of proof-spirit in the spirit-receiver; but should this prove, on an average of a twelvemonth, to be less than the quantity of proof-spirit the distiller has to pay up the deficiency: if, on the contrary, there is an excess, the excise retains the benefit of that excess. It was stated in evidence given before a Committee of the House of Commons on Distillation, a few years ago, that the quantity of proof-spirit produced is generally rather over than under the quantity estimated from the wash; but that the estimate is a very near approximation as a general average. If the spirit in the receiver is 'over-proof,' an increased rate of duty is not charged, but the spirit is hypothetically increased in quantity to the requisite dilution, and then the duty applied. Suppose, for example, there is one hundred gallons of spirit 25° over-proof; this implies that if twenty-five gallons of water were added the mixture would be at proof; the distiller is thereupon charged duty on one hundred and twenty-five gallons of proof-spirit.

From the spirit-receiver, the spirit passes to the store-warehouse, a long building situated in the western part of the distillery. Here are ranged seven or eight large store-vats, numbered (as most of the vessels are required by law to be in a distillery) and inscribed with their liquid capacity. This store-room is provided with the requisite conveniences for filling casks from the store-vats, and for despatching them from the distillery. As spirit does not, like beer, improve by being kept in store for a considerable period, there is no necessity for that vast array of vats which forms such an object of wonder at the great porter-breweries; and as spirit is, bulk for bulk, twelve or fifteen times dearer than porter, a small establishment of barrels, wagons, horses, &c. will be adequate for the business of a large distillery.

RECTIFYING AND COMPOUNDING.

Let us now recapitulate the steps through which we have traced the production of spirit. In the first place the grain—consisting of any of the usual varieties, and either raw or malted—is crushed or ground, as a means of allowing the hot water to act more readily on the farinaceous ingredient. In the next place this grain is mashed with water till a heavy liquid called 'worts' is extracted. Then the 'worts' are fermented, by which the saccharine principle is converted into alcohol; and lastly, this alcohol is, by repeated distillations, separated from the greater portion of the water with which it had been combined. The result is called 'plain British spirits.' But we have not yet done with it; we have yet to trace it through the hands of another manufacturer.

The liquid so highly valued in science as 'spirit of wine,' the various forms of spirituous liquors known as hollands, whiskey, gin, British brandy, &c., and the brands known as 'plains' and 'improved' spirits, are produced by the rectifier from plain spirit purchased by him from the distiller. This is a distinction which we have not hitherto had an opportunity of explaining. As a means of preventing any surreptitious proceedings in respect of duty, the excise laws prohibit the carrying on of two distilleries, or one distillery and a rectifying establishment, within a quarter of a mile of each other. They also limit the quantity of spirit which the distiller may sell, to a minimum of eighty gallons at one time, with which must be given a 'permit.' As a general rule we may state that British spirit (we exclude mention of Scotch and Irish whiskey, as, although plain malt-spirit, they are regulated by clauses in the act applying specially to them) is but little known in the form in which it leaves the distillery, since it receives from the hands of the rectifier the peculiar properties by which it is rendered familiar. The person's name often attached to spirituous, liquors, as a guarantee for the quality, is the hallmark of the manufacturer. There are only six distilleries in the vicinity of London, and, we believe, no more than nine in the whole of England, all the other establishments called by that name being places where the spirit, made from the malt or grain by the distiller, is redistilled, 'rectified,' or purified, and compounded with various vegetable substances to impart flavour.

Among the rectifying distilleries in the metropolis we have avoided ourselves of permission to visit that of Messrs. Stephen Child and Son, in Trinity Street, Southwark, one of the most elegant and scientific manufactories we have ever seen, in which the results of modern science are brought to bear on the particular branch of manufacture with much tact and discrimination. This distillery has been recently erected on a plot of ground belonging, we believe, to the Trinity House; and in virtue of a stipulation that the building should be an architectural ornament to the spot, the exterior has been made one of the most highly decorated in that part of the metropolis: indeed its facade would bear comparison with most of the West-end club-houses.

This distillery consists of a square court-yard surrounded by buildings. The eastern, western, and southern sides comprise various offices and buildings of a subsidiary character, such as warehouse, waggon-sheds, stables, harness-rooms, &c.; while the
 northern side comprises the building in which all the operations of the distillery are carried on. This latter is supplied with an ornamental chimney, which is likely long to retain its cleanly appearance, for nearly all the smoke produced by the furnaces is consumed; a principle the further adoption of which in our manufactories would be a step of incalculable benefit. We shall best describe the arrangement of the various parts of the building by tracing the progress of the spirit through them.

The raw spirit is sold by the distiller to the rectifier in two different strengths, viz. 23° over-proof, and 11° over-proof, both of which are rigorously fixed by the legislature. The spirit is brought to the rectifier in casks belonging to the distiller, with an excise permit; and an officer visits the rectifying distillery to see that all the spirits received there have paid duty: beyond this point the excise laws do not control the rectifier, except in one or two minor points. Supposing a cask of raw spirits to be conveyed to Messrs. Child's establishment, it is hoisted into a large square room called the warehouse, lined with brick, and with rows of store-vats placed in the still-room. The cask is rolled upon a weighing-machine, which is connected to a very ingeniously constructed steelyard, whereby the weight of the spirit and cask is determined. The empty cask being afterwards weighed, affords the means of determining the exact weight of the spirit; after which a reference to a thermometer and a printed table shows the exact number of gallons of spirit. The weighing-machine being level with, and indeed forming part of the floor, and the steelyard being portable, the necessity for heavy scales is wholly obviated.

When the full cask has been weighed, it is rolled over an opened trap-door in the floor, the bung is removed, and the spirit is allowed to flow out into a store-vat placed in the room beneath for its reception. This trap-door is provided with means for saving any alcoholic vapour which may rise from the spirit beneath. We next proceed to the underground vaults, where we see a range of store-vats for the reception of raw spirit, preparatory to the rectifying processes; and from thence we are conducted by a tunnel of pipes, to the still-room, an apartment small in dimensions, but full of scientific appliances. On one side of this room we see a large iron tank, about thirty feet long and ten high: this is divided into four compartments, and serves as a worm-tank for containing the cold water with which the spirit is condensed. In the centre there is a heavy wall of stone, this dividing the tank into four stills, one for gin, one for spirit of wine, one for British brandy and British rum, and one for cordials. These stills are not heated by open fires, but by steam; a layer or thin stratum of steam being allowed to act on the lower half of each still, something on the principle of a sugar-boiler. The steam for this purpose is generated in two large cylindrical boilers, heated by smoke-consuming furnaces in which Merthyr Tydvil coals are burnt, the steam-pipes being covered with non-conducting substances to prevent the loss of heat. Supposing the spirit to be converted into gin, one of the stills is seven-tenths filled from the store-vats, and steam is admitted to act on the still. The contents ascend in vapour, which is afterwards condensed in the worm-tanks. This distillation is the rectifying of the spirit, by which a certain portion of essential oil is removed from it. Then ensues the compounding, which is a redistillation with certain herbs, berries, and seeds, in order to impart the particular flavour whereby the liquid is known. This is done in portions, in order to preserve the strength of the spirit when it comes into the hands of the rectifier, he reduces it, when in the form of gin, to a strength not greater than 17° under-proof.

If spirit of wine is to be made, the crude spirit is pumped into a still whose upper part consists of a vertical cylinder, containing a large number of pipes. The vapour ascending these pipes, and the pipes being surrounded by water at about 180°, the arrangement effects (on the principle we have before explained) so extensive a separation between the alcoholic and aqueous vapour, that spirit can be obtained as high as 62° over-proof; it must, by law, be as strong as 42° over-proof; but the saleable strengths are from about 54° to 60°.

If British brandy, British rum, or cordials are to be made, the spirit is redistilled with various vegetable substances calculated to impart the requisite flavour. By an ingenious arrangement, patented, we believe, by Messrs. Pontifex, the alcoholic vapour, instead of condensing in the worm-tank, passes into a flavouring-vessel containing the ingredients, so as to imbibe the qualities of those ingredients while condensing: it is again converted into vapour, and then passes through the worm-tank, to be finally condensed in the usual way.

All the various liquors, as condensed in the worm, are introduced into an store-room for the reception. This store-room is also kept up a powerful hydraulic press, capable of exerting a pressure of a hundred and fifty tons: this is employed for pressing some of the fruits used in the preparation of cordials, such as raspberry and cherry-brandy. In the upper part of the building is a store-room for the cinnamon, peppermint, cloves, aniseed, juniper-berries, and various berries, seeds, and fruits used in the preparation of cordials, and in flavouring the various kinds of spirit, together with the requisite apparatus for preparing them for the still.

In every part of this establishment the arrangements for the economising of heat are very complete. We have said that the furnaces consume nearly all their own smoke. This is effected by supplying fuel in such a manner, that the smoke from the new coal must pass over highly heated fuel before it can reach the chimney, and thereby nearly all its power is retained for the steam, to the great advantage of economy.

The stills, too, are not only heated by steam, brought from boilers in pipes covered with non-conducting substances, but the heat of this steam when condensed is even saved. A small apparatus called a ‘condensing-box,’ contrived by Messrs. Pontifex, is placed in the still-room for this purpose, and acts as follows:—As fast as the hot water flows into a cylindrical cavity in which a heavy circular stone moves up and down. This stone is exactly balanced by a weight at the other end of a lever, so that a small power suffices to move the stone. The hot water, filling the space beneath the stone, gradually raises it, and in so doing acts upon a catch which opens a valve, and allows all the water to descend into the boiler in the room beneath. Thus all the heat contained in the condensed steam is effectually preserved.

The boilers, steam-engines, and pumps, employed in the various operations of the establishment, are all of the most modern forms, and are arranged with singular economy of space, each being placed within a very few feet of the spot where its power is to be practically applied.

We have, in conclusion, to acknowledge thecourtesy of the respective proprietors of these two establishments, in affording the means for presenting this brief outline of a manufacture in which so large an amount of scientific skill is involved.
THE OLD AND YOUNG COURTIER.—No. VIII.

APPAREL.

If the "queen's old courtier" resided at court, he must have known "what belonged to coachmen, footmen, or pages," as will have been seen from the letter of the Countess of Northampton, at p. 222, and from other passages we have quoted. Coaches were certainly novelties in the reign of Elizabeth, having been first introduced about 1555, and when the queen went in state to St. Paul's to return thanks for the defeat of the Armada, though she rode in a "hollow-turning coach, with pillars and arches,"* her attendants rode on horseback. Before the end of her reign, however, they had been rapidly multiplied, and a French mission of congratulation to James I. on his accession went in thirty coaches.†

The "gaudy-coloured fans" of the ballad were formed, as is shown in the engraving to No. VI., of feathers, sometimes those of the ostrich, but the more rare and costly the better. The handles were of silver, or some other valuable material, and occasionally ornamented with jewels; one such, presented to Elizabeth on her birth-day, was said to have been worth 400l.: they were not all, of course, so expensive; for Falstaff, in the 'Merry Wives of Windsor,' tells Pistol, "When Mistress Bridget lost the handle of her fan, I took't upon mine honour thou hadst it not;" and Pistol retorts, "Didst thou not share? hadst thou not fifteen pence?" The attempt to reduce the price of all fashionable vanities to the means of the general mass has been probably as strenuous at every period as it continues to be at the present.

"Different dressings of other women's hair" was not a peculiarity of either the reign or court of James. The custom had existed during the life of his predecessor, and was common on the Continent. Indeed it was not till a much later period that the full enormity of the fashion was reached, in the full-bottomed wigs of the men, from the time of Charles II. to that of George III.; and the towering commodes and toupees of the women, with some temporary interruptions, for about the same period. A custom which has existed from the time of the Pharaohs, as is proved by

* Stow.
† See 'Penny Magazine,' vol. iii., p. 321, for an article on the History of Coaches; and vol. i., p. 183, New Series, and vol. iv., p. 186, Old Series, for notices of travelling. There was progress, but no very marked difference between the two reigns.

No. 664.
the existence of one of the periwigs in the Egyptian collection of the British Museum, is not likely to be easily extirpated: we may congratulate ourselves that the "other women's hair" is not openly paraded, but that improved taste has led the wearers, when adopted, to endeavour to make it appear as simple and natural as possible.

In fact, the changes in apparel and ornament were no more than mere changes of fashion, probably accelerated by growing wealth; and was marked rather by a cessation of the fruitless attempts to regulate the modes of dress, which, down to the time of Elizabeth, monarchs, legislators, and municipalities had been vainly endeavouring to effect. We give two or three specimens of these enactments:—In 4 and 5 Phil. and Mar. it was ordered, that none of the Society of the Middle Temple should "thereforeforth wear any great breeches in their hose, made after the Dutch, Spanish, or Almon [German] fashion; or lawn upon their caps; or cut doublets, upon pain of 3s. 4d. forfeiture for the first default, and the second time to be expelled the house." In 26 Eliz. the following regulation was made by the same society for reformation in matters of clothing:—

2. Nor any white colour in doublets or hose. 3. Nor any facing in cloaks but such as were of the bench. 4. That no gentleman should walk in the streets in James I. was little more than a continuation of the "other women's hair" not openly paraded, but that improved taste has led the wearers, when adopted, to endeavour to make it appear as simple and natural as possible.

Anatomy of Abuses," so excessively violent, was declared, that they have "no order for their apparel, but the most inarked feature of the time. Without going every man as he might, as given in the Progresses, is also worthy of notice from the minuteness of its detail. It is the fashion; in which they compare themselves to the description given in the "Hue and Cry, for the apprehension of a youth, and includes in addition an enumeration of many of the ornaments of his master. He was equipped in "one doublet of yellow million fustian, the one-half thereof buttoned; with peach-colour hose laced with small tawny lace; a grey hair, with a copper edge round about it, with a band, parcel of the same. Had a pair of watchet [blue] stockings. Likewise her headdress, the oue of versery colour, guarded with two guards, of black cloth and twisted lace of carnation colour, and lined with crimson baize; and the other is a red sheep-susset colour, striped down the cape, and down the foreface twisted with two rows of twisted lace; russet and gold buttons, afore and upon the shoulder, being of the cloth itself, set with the said twisted lace, and the buttons of russet, silk, and gold. This youth's name is Gilbert Edwod, and page to Sir Valentine Browne, knight, who is run away this fourth day of January, with these parcels following: viz., a chain of wire-work gold, with a button of the same, and a small ring at it; two flagging chains of gold, the one being marked with these letters V and B upon the back, and the other with a little broken jewel at it, one carcanet of pearl, and jays and thereto hanging; a jewel like a "marrimade" of gold, enamelled, the tyle [tail] thereof being set with diamonds, the belly of the . . . . . . made with a ruby, and the shield a diamond; the chain wherupon it hangeth is set with small diamonds and rubies; and certain white gold rings, briefly." The author of the "History of British Costume" has said, very justly, that the "costume of the reign of James I. was little more than a continuation of the dress of the latter part of the reign of Elizabeth," The starched ruff, against which Stubbs, in his "Anatomy of Abuses," was so excessively violent, was the most marked ornament of the time. Going into minute detail, we shall endeavour now to show the general nature of these adornments by some extracts from contemporary dramatists:—In Jonson's "Every Man out of his Humour," Fastidious Brisk, a top, is asked if a certain lady be his mistress; he answers—

"Faith, here be some slight favours of hers, sir, that do speak it, she is; as this scarf, sir, or this riband in my ear, or so; this feather grew in her sweet fan sometime, though now it be my poor fortune to wear it."

The costume of a page of the time of Queen Elizabeth, as given in the "Progresses," is also worthy of notice from the minuteness of its detail. It is the description given in the "Hue and Cry," for the apprehension of a youth, and includes in addition an enumeration of many of the ornaments of his master. He was equipped in "one doublet of yellow million fustian, the one-half thereof buttoned; with peach-colour hose laced with small tawny lace; a grey hair, with a copper edge round about it, with a band, parcel of the same. Had a pair of watchet [blue] stockings. Likewise her headdress, the oue of versery colour, guarded with two guards, of black cloth and twisted lace of carnation colour, and lined with crimson baize; and the other is a red sheep-susset colour, striped down the cape, and down the foreface twisted with two rows of twisted lace; russet and gold buttons, afore and upon the shoulder, being of the cloth itself, set with the said twisted lace, and the buttons of russet, silk, and gold. This youth's name is Gilbert Edwod, and page to Sir Valentine Browne, knight, who is run away this fourth day of January, with these parcels following: viz., a chain of wire-work gold, with a button of the same, and a small ring at it; two flagging chains of gold, the one being marked with these letters V and B upon the back, and the other with a little broken jewel at it, one carcanet of pearl, and jays and thereto hanging; a jewel like a "marrimade" of gold, enamelled, the tyle [tail] thereof being set with diamonds, the belly of the . . . . . . made with a ruby, and the shield a diamond; the chain wherupon it hangeth is set with small diamonds and rubies; and certain white gold rings, briefly." The author of the "History of British Costume" has said, very justly, that the "costume of the reign of James I. was little more than a continuation of the dress of the latter part of the reign of Elizabeth," The starched ruff, against which Stubbs, in his "Anatomy of Abuses," was so excessively violent, was the most marked ornament of the time. Going into minute detail, we shall endeavour now to show the general nature of these adornments by some extracts from contemporary dramatists:—In Jonson's "Every Man out of his Humour," Fastidious Brisk, a top, is asked if a certain lady be his mistress; he answers—

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It was a mark of fashionable gallantry of that day for the men to wear some token of their mistress's favour publicly; gloves, ribands, &c. were the usual articles, and many allusions occur of this custom, as also of wearing roses, or knots of ribands in the ear, which belonged to them. In "Every Man in his Humour," and in the "Silent Woman," by the same author, he speaks of yellow doublets and great roses; and in the latter play, published in 1609, he thus describes what will be required by the wife:

"She must have that rich gown for such a great day, a new one for the next, a richer for the third; be served in silver; have the chamber filled with a succession of grooms, footmen, ushers, and other messengers; besides embroiderers, jewellers, tinswomen, sempsters, feathermen, perfumers; whilst she feele not how the lands drop away, nor how the acres melt; nor foresee the change, when the merchant has your woods for her velvets; never weigh what your pride costs, sir."

But Massinger in 1632, in his 'City Madam,' has given us the most complete pictures of the female dresses of the period. Luke, the brother and supposed heir of Sir John Frugal, has reduced his sister-in-law and his nieces to a coarse dress, "biffin gowns and green aprons," with "a French hood, now it is out of fashion; in which they compare themselves to the fantastic nature of the fashions of the time."

He then proceeds to reproach them with their pride and extravagance, addressing the mother—

"Exchange wenches, Comming from eating pudding-pies on Sunday At Pimlico or Islington."

* This word is illegible. This jewel like a mermaid shows the fantastic nature of the fashions of the time.
"Your father was
An honest country-farmer, goodman Humble,
By his neighbours ne'er call'd Master. Did your pride
Descend from him? but let that pass: your fortune,
Or rather your husband's industry, advanced you
to the rank of a merchant's wife. He, made a knight,
And your sweet mistress-ship ladyed you, wore
Satin on solemn days, a chain of gold,
A velvet hood, rich borders, and sometimes
A charity miner's cap; a silver pin
Heaped with a pearl worth threepence, and thence far
You were privileged, and no man envied it;
It being for the city's honour that
There should be a distinction between
The wife of a patrician and plebeian.

But when the height
And dignity of London's blessings grew
Contemptible, and the name lady-mayores
Became a by-word, and you scorn'd the means
By which you were raised, my brother's fond indulgence
Giving the reins to; and no object pleased you
But the glittering pomp and bravery of the court;
What a strange, very monstrous, metamorphosis followed!
No English workmen then could please your fancy.
The French and Tuscan dress your whole discourse;
This bawd to prodigality entertain'd
No English workmen then could please your fancy.

And I marvel no man take heed of it, what number
First of trifles comes bither from beyond the sea, that
We might either pay inestimable treasure every year,
Or else exchange substantial wares and necessaries for them;
For which we might receive great treasure. Opposite which sort I mean that
drinking; and also glaze windows, dials, tables, cards,
Balloons (little balls) of silk and silver, earthen-pots, pins
And points, hawk's bells, paper both white and brown,
And a thousand like things that might either be clean
Spared or else made within the realm sufficient for us:
as for some things, they make it of our own commodities,
And send it us again, whereby they set their people a-work,
And to exhaust much treasure out of this realm,
as of our wool they make clothes, caps, and kerseys; of our felts (bides); they make Spanish skins,
Gloves, knives, girdles; of our tin, salt-sellers, spoons,
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impeil in the same direction, though marked by some unessential variations. In laments over the past, like that of the 'Old and Young Courtier,' we are too apt to overlook the evils that have ceased to exist, and to exaggerate the present ones. The main effects are only developed in the general manners, and the most important and enduring are caused by more extended and better adapted instruction.

KENILWORTH.

The Second Part of 'William Shakspere: a Biography' contains a chapter on the 'Princely Pleasures of Kenilworth' in 1575, when the Earl of Leicester entertained Queen Elizabeth with unequalled magnificence. The novel of Sir Walter Scott has made every one familiar with this remarkable place. The following conclusion of the chapter to which we refer describes the ruins of this magnificent castle, and the impressions they produce:—

"Laneham* asks a question which in his giddy style he does not wait to answer or even to complete:—

'And first, who that considers unto the stately seat of Kenilworth Castle, the rare beauty of building that his Honour hath advanced, all of the hard qu arry-stone; every room so spacious, so well delighted, and so high roofed within; so seemily to sight by due proportion without; in day-time on every side so glittering by glass; at nights, by continual brightness of candle, fire, and torch-light, transparent through the lightsome windows, as it were the Egyptian Pharaoh's palace unto all the Alexandrian coast,—who that considers (we finish the sentence) what Kenilworth thus was in the year 1575, will not contrast it with its present state of complete ruin? Never did a fabric of such unequalled strength and splendour perish so ingloriously. Leicester bequeathed the possession to his brother the Earl of Warwick for life, and the inheritance to his only son, Sir Robert Dudley, whose legitimacy was to be left doubtful. The rapacious James contrived, through the agency of the widow of the Earl of Leicester, to cheat the son out of the father's great possessions. The more generous Prince Henry, upon whom Kenilworth was bestowed, negotiated for its purchase with Sir Robert Dudley, who had gone abroad. A fifth only of the purchase-money was ever paid; yet upon the death of his brother, Charles took possession of the castle as his heir. A stronger than Charles divided the castle and lands, thus unjustly procured by the Crown, amongst his captains and counsellors; and from the time of Cromwell the history of Kenilworth is that of its gradual decay and final ruin. No cannon has battered its strong walls, 'in many places of fifteen and ten foot thickness;' no turbulent soldiery has torn down the hangings and destroyed the architraves and carved ceilings of 'the rooms of great state within the same;' no mines have exploded in its 'stately cellars, all carried upon pillars and architecture of freestone carved and wrought.' The buildings were whole, and are described, as we have just quoted, in a survey when James laid his hand upon them. Of many of the outer walls the masonry is still as fresh and as perfect as if the stone had only been quarried half a century ago. Silent decay has done all this work. The proud Leicester, who would have been king in England, could not secure his rightful inheritance to his son, undoubtedly legitimate, whom he had the baseness to disown whilst he was living. No just possessor came after him. One rapacity succeeded another, so that even a century ago Kenilworth was a monument of the worthlessness of a grovelling ambition.

The historian of Warwickshire has given us 'the ground-plot of Kenilworth Castle' as it was in 1640. By this we may trace the pool and the pleasure; the inner court, the base court, and the tilt-yard; Caesar's

* Laneham, who was a gentleman usher of Elizabeth's court, wrote a very curious account of the particulars of this visit of the Queen to her favourite.
The origin of the South Sea Company may be traced to Harley, Earl of Oxford, who, to restore the public credit, which had suffered from the removal of the Whigs from power, brought forward his "master-piece." This was the forming the creditors, to whom was owing the floating debt of the nation, into a Company, which should have six per cent, interest on their debts (in all ten millions), by rendering permanent various duties, such as those on wines, vinegar, tobacco. As a still greater allurement, the South Sea trade, from which great things were at that time expected, was to be secured to them only. The idea was marvellously well received, and the Company incorporated as the "Governor and Company of Merchants of Great Britain trading to the South Seas and other parts of America." But the King of Spain had his own views of this matter of admitting British merchants into his Transatlantic ports; and the result was, the Company obtained only such advantages as were to be derived from the infamous Assiento, or contract, empowering them to supply Spanish America with negroes from the African continent, and from the permission to send one ship annually with a cargo of goods for sale. Even these advantages, such as they were, had already been granted before they were recalled by the war with Spain, which broke out in 1718, or the year after the first annual ship had sailed. Still there seems to have been an indefinable sort of confidence that something great would yet result from the South Seas; the merchants could not cease to look upon its islands as their Promised Land; consequently the Company's stock on its return was bought up by the Company still enjoyed the public confidence— their next movement was to show how worthily. The ministers had conceived the idea that means might still be devised for the formation of a great South Sea trade, which should be so profitable as to pay off all the national incumbrances. Their prompter, it is highly strange, was at J. & J. Want, a lady who was a Director of the Company, who is known to have taken great pains to show ministers the advantage that would result from consolidating all the funds into one, and to have particularly pointed out the effective assistance which his Company might render. An offer even was made by Sir John, on the part of the latter, to liquidate the whole of the national debt by taking the funds were formed into one as proposed, if certain commercial privileges were granted, and, lastly, if they were empowered to take in by purchase or subscription both the redeemable and irredeemable national debt, on such terms as might be agreed on between the Company and the proprietors. Ministers laid the stock on the table of the House of Commons for consideration, and the proprietors of the Company had said they would obtain the preference cost what it would, and they made good their word. Leave was given to bring in a bill founded on their proposals. It may now be worth while to inquire what the Directors really intended; and perhaps the best answer is to be found in their private proceedings at this moment, which were known to the ministers of the subsequent Parliamentary inquiry. The books now presented a total sum of above a million and a quarter of money, upon account of stock to the amount of 574,500l., which was there stated to have been sold on various occasions, and at prices varying from 150 to 326 per cent. Of this professed 574,500l. worth of stock, only about 100,000l. was really paid in, and what was assigned, without value received of any kind, to the Directors, or the members of Government, whom it was desirable to bribe. Thus 3,000l. stood against the Earl of Sunderland's name; 10,000l. against the Duke of Kendal, the King's ill-favoured German mistress; 10,000l. to the Countess of Platen, a lady enjoying a similar position, and a like sum to her two nieces; 30,000l. to Mr. Secretary (of State) Crags; 10,000l. to Mr. Charles Stanhope, one of the Secretaries of the Treasury; and some large sums by a more circuitous mode to Aislabie, the Chancellor of the Exchequer, who introduced the propositions to Parliament. Some of our readers may not readily perceive the immediate effect of this arrangement; we offer, therefore, a slight illustration. The day before the Parliament gave leave for the bringing in of the bill referred to, the Company's stock stood at 130; almost
would have deserved the encouragement they now, him, in Fenton's words, "a clean shirt and a shoulder undeservedly, met with; such, for instance, as some of muttoneveryday." But the true gambling spirit men to cast nativitics; and above all was onewith a forblis lifefrom the people whom he had beggared. tion. Maitland alsomentions, among his general list of a number of their bonds. The Bank at first consented; the great fisheries proposed, the fire-assurance compa- had infected the poetas well as everybodyelse: it nics, silk and cotton manufactories, &c.&c. But of shouldbe allornothing; so it was—nothing. For themajor part we may saythey were as extravagant sometime afterward Gay's lifewas in danger, so they were intended. In illegal, when the evilbecametoo imminent for the themost earnest and impressivemanner prophesied Government to leave it onec, we ... desired to come up from his country in human hair, for furnishing funerals to any part of seat to London, and usehis influence with the Bank of Wales, the heir to the throne, joined in the general scramble that was going on, and put down his name as governor of some Welsh Copper Company, although warned that he was subjecting himself to a prosecution in so doing. He soon made 40,000l., and then withdrew in time to avoid the evil that had been pointed out. These prosecutions were carried on at the instigation of the South Sea Company, who, as it has been observed, "desiring to monopolise all the folly and all the money of the nation," set to work against the managers of the minor bubbles, and thus destroyed most of them. Their very proceedings, however, it is probable caused attention to be paid to the basis of all these speculations, and most alarming was the result. Many began now to see very clearly that the value of the South Sea stock really rested on nothing of its own, but the small evidence, that in the beginning of August the price was quoted at a thousand. The bubble had now reached its highest point, and began to descend. Suspicion first became raised apparently by the means adopted in making out the share-lists for the different subscriptions, with what reason we have already shown. The next circum- stance was of a much more startling nature: it was generally reported that Sir John Blunt, the chairman, and some others, had sold out. By the 2nd of Sep- tember the stock had fallen to seven hundred. The Directors, to alay the alarm, called a meeting at Merchant Tailors' Hall on the 8th. The room was filled to suffocation. Sir John Fellowes, the sub- governor, was made chairman. Many Directors spoke of the raising union of allDescriptions of the conduct. A Mr. Hungerford, a member of parliament, with thoughtful kindness, observed, "They had enriched the whole nation, and he hoped they had not forgotten themselves." The Duke of Portland won- dered how anybody could be dissatisfied; and, in short the Directors had it all their own way. That same evening, however, the fall was renewed and to fifty and forty, and the next day to five hundred and forty. Bankers, brokers, and merchants began to break daily, and many, in utter despair of redeeming anything, even character, fled the country, each involving hundreds of lesser houses with him. Gay, the poet, was a sufferer, under peculiar circumstances. The younger Craggs had at an early period succeeded a Mr. Aislabie's name was down for 70,000l., Mr. Craggs, senior, for 650,000l., the Earl of Sunder- land for 160,000l., and Mr. Stanhope for 47,000l. The bill passed, and some time after the stock rose in value to above 1000 per cent. The unheard-of profits that it foretold the prime-movers in this affair to make, under such circumstances, are very evident; though it is highly probable that some even of them were carried away by their own schemes, and, ventur- ing too long, shared in the general loss at the last. To produce the continual rise in the value of their stock, means as infamous as the ends which some at least of the Directors had in view were adopted. Markets of invoices were formed, to increase the demand for securities, and these relations of the transactions were so disguised as to make the Directors almost as little accountable for those wonderful South Seas, mines of incalculable depth full of the precious metals. Fifty per cent. dividends, in short, were the least that the holders of the stock were to expect. Landlords sold their estates, merchants neglected their establishments, and trades- men shut up their shops, to flock to the Exchange and vest the money of the nation. The bubble expanded to such prodigious dimensions that every stock, from the Directorship to the commonest office, was in the power of the prime-movers in this affair, who, in order to save the Company was at last and
GROUND-ICE, OR GROUND-GRU.

It is generally imagined that rivers freeze only at the surface; this, however, is not the fact, ice being frequently formed at the bottom of running water. Thus, according to Dr. Farquharson, the phenomenon is so common, and so well known in certain parts of Lincolnshire, that the inhabitants have given it the name of Ground-gru, a name which that gentleman has adopted in his paper on the subject in the ‘Philosophical Transactions’ for 1835, p. 329. Gru is the name by which the people of Lincolnshire designate snow saturated with or swimming in water; and as the ice formed at the bottom of rivers very nearly resembles that in appearance, a better name than Ground-gru could hardly be given, though it would be more precise to call it subaqueous ice, in contradistinction to that found at the surface, and because the term Ground-ice, which this formation has also received, has been sometimes given to the ice occasionally met with at certain depths in the ground in northern countries.

Contrary, however, as may be the phenomenon of subaqueous ice, and although it has been noticed at various times, it has but very lately attracted the serious attention of observers. Ireland, in his ‘Picturesque Views of the River Thames,’ published in 1792, 2 vols. 8vo., mentions the ground-ice of that river, and on the subject quotes Dr. Plot, who says, ‘the river Thames is often covered with ice, which, on the bank, is of a greenish tinge, and resembles patches already mentioned, has published his observations on the ground-gru of the Don and Lechel in Lincolnshire.

Here it would appear that the phenomenon is by no means uncommon; perhaps it is general; though, from its very nature, little likely to attract attention, particularly in waters that are somewhat deep.

Almost all who have written on ground-gru have endeavoured to account for it, though no explanation yet given is perfectly satisfactory, and least of all those of Dr. Farquharson and Mr. Eisdale. The former gentleman says it is the result of radiation, and endeavours to substantiate his reasoning upon the principles of the formation of dew, seeming to forget entirely that Dr. Wells maintains expressly that wind and shade are alike obstacles to radiation; and that consequently a body of moving water so deep as to be impervious to light, and particularly when covered, as in the case of the Neva, with a sheet of ice three feet thick, and as much more of snow, must present an insurmountable obstacle to the radiation of heat from the bottom of the river. Mr. Eisdale thinks ground-ice is the result of the frozen spicula of the air falling into the river, and there forming nuclei, around which the water freezes at the bottom; but this is quite inadmissible. M. Arago’s explanation in part, and the very simple fact that water, when at 32° of Fahr., if at rest, or in very slow motion (which is the case at the bottom of rivers), will freeze, seem among the most natural ways of accounting for the formation of ground-gru. M. Arago attributes the formation to three circumstances—1st, the inversion, by the motion of the current, of the hydrostatic order, by which the water at the surface, cooled by the colder air, and which at all points of the temperature of water under 32° of Fahr. would, in still water, continue to float on the surface, is mixed with the warmer water below; and thus the whole body of water to the bottom is cooled alike by a mechanical action of the stream; 2nd, the aptitude to the formation of crystals of ice on the stones and asperities of the bottom in the water wholly cooled to 32°, similar to the readiness with which crystals form on pointed and rough bodies in a saturated saline solution; 3rd, the existence of a less impediment to the formation of crystals in the slower motion of the water at the bottom than in the more rapid one near or at the surface. But, as has been said, no explanation yet given is quite satisfactory, and the phenomenon yet remains to be studied under all the variety of circumstances which may attend it. A knowledge of the temperature of the water at different depths is most essential to a just appreciation of the real cause of the phenomenon.

Ground-gru differs materially from surface-ice. Dr. Farquharson, in his paper, highly interesting as regards facts, describes it as having “the aspect of the aggregated masses of snow, as they are seen floating in rivers during a heavy snow-shower; but on taking it out of the water, it is found to be of a much firmer consistence than those: it is a cavernous mass of various sized, but all small, pieces or crystals of ice, adhering together in an apparently irregular manner by their sides, or angles, or points promiscuously: the adhesion varies according to circumstances.” This corresponds precisely with what is stated by Col. Jackson to have been observed by him in the Neva at St. Petersburg. Dr. Farquharson says, that when it begins to form at the bottom, it aggregates in forms somewhat resembling little hearts of califlower. Mr. Weitz, author of the paper in the ‘London Geographical Journal’ on the ground-gru of the Siberian rivers, says that which he noticed at the bottom of the Kann (an affluent of the Jenissei), 40 versts from Krasnojarsk, was of a greenish tinge, and resembled patches of the confervoides. From these facts we conclude that though the appearances of the ground-gru may vary with circumstances, it is in all cases essentially different from the solid compact sheets of surface-ice.

THE TALEGALLA.

[Concluded from page 294.]

In the Megapodius Tumulata the head and crest are of a very deep cinnamon-brown; back of the neck and all the under surface very dark grey; back and wings cinnamon-brown; upper and under tail-coverts dark chestnut-brown; tail blackish-brown; irides generally dark brown, but in some specimens light reddish-brown.
brown; bill reddish-brown, with yellow edges; tarsi and feet bright orange, the scales on the front of the tarsi from the fourth downwards, and the scales of the toes, dark reddish-brown. (Gould.)

Size about that of a common fowl.

This is the *Oreopogon* of the aborigines of the Cobourg Peninsula; the *Jungle-Fowl* of the colonists of Port Essington.

On Mr. Gilbert's arrival at Port Essington his attention was attracted to numerous great mounds of earth which were pointed out to him by some of the residents as being the tumuli of the aborigines. The natives, on the other hand, assured him they were formed by the *Jungle-fowl* for the purpose of hatching its eggs. But this last statement appeared so extraordinary, and so much at variance with the general habit of birds, that no one in the settlement believed them, and the great size of the eggs brought in by them as the produce of this bird strengthened the doubt of the veracity of their information. Mr. Gilbert, however, knowing the habits of *Leipoa*, took with him an intelligent native, and proceeded about the mound nearest to Knocker's Bay, a part of Port Essington harbour comparatively little known but little known, and where he had been informed a number of these birds were to be seen. He landed beside a thicket, and had not advanced far from the shore when he came to a mound of sand and shells, with a slight mixture of black soil, the base resting on a sandy beach, only a few feet above high-water mark. It was enveloped in the large yellow-blossomed *Hibiscus*, was of a conical form, twenty feet in circumference at the base, and about five feet high. On asking the native what it was, he replied, "Oreopogon Ramb!* (Jungle-fowl's house or nest). Mr. Gilbert scrambled up the sides of it, and found a young bird in a hole about two feet deep; the nestling, apparently only a few days old, was lying on a few dry, withered leaves. Mr. Gilbert assured him that it would be of no use to look for eggs, as there were no traces of the old birds having lately been there. Mr. Gilbert took the utmost care of the young bird, placed it in a moderate-sized box into which he introduced a large portion of sand, and fed it on bruised Indian corn, which it took readily. It remained in captivity, it was incessantly employed in scratching up the sand into heaps, and Mr. Gilbert remarks that the rapidity with which it threw the sand was more than surprising for so young and small a bird, its size not being larger than that of a small quail. At night it was restless that Mr. Gilbert was constantly kept awake by the noise it made in endeavouring to escape. In scratching up the sand the bird only employed one foot, and having grasped a handful as it were, threw the sand behind it with but little apparent exertion, and without shifting its standing position on the other leg. Mr. Gilbert observes, seemed to be the result of an innate restless disposition and a desire to use its powerful feet, and to have but little connection with its feeding; for, although Indian corn was mixed with the sand, Mr. Gilbert never detected the bird in picking any of it up while thus employed.

Mr. Gilbert continued to receive the eggs without any opportunity of seeing them taken from the ground until the beginning of February, when, on again visiting Knocker's Bay, he saw two taken from a depth of six feet, in one of the largest mounds he had met with. In this instance the holes ran down in an oblique direction from the centre towards the outer slope of the hillock, so that although the eggs were six feet deep from the summit, they were only two or three feet from the side.

How the young effect their escape does not appear; some natives told Mr. Gilbert that the nestlings effected their escape unaided; but others said that the old birds at the proper time scratched down and released them. The natives say that only a single pair of birds are ever found at a mound at a time. Our space will not permit a more detailed account of these highly curious mounds; but the reader should consult Mr. Gould's highly valuable work for other particulars: we can only spare room for Mr. Gilbert's description of the general habits of this interesting species.

"The Jungle-fowl is almost exclusively confined to the dense thickets immediately adjacent to the seashore: it appears never to go far inland, except along the banks of creeks. It is always met with in pairs or quite solitary, and feeds on the ground, its food consisting of roots which its powerful claws enable it to scratch up with the utmost facility, and also of seeds, berries, and insects, particularly the larger species of Coleoptera. It is at all times a very difficult bird to procure; for although the rustling noise produced by its stiff pinions when flying away be frequently heard, the bird itself is seldom to be seen. Its flight is heavy and unsustainable in the extreme; when first disturbed it invariably flies to a tree, and on alighting stretches out its head and neck in a straight line with its body, remaining in this position as stationary and motionless as the branch upon which it is perched: if however it becomes fairly alarmed, it takes a horizontal but laborious flight for about a hundred yards with its legs hanging down as if broken. I did not myself detect any note or cry, but from the native's description and imitation of it, it much resembles the clucking of the domestic fowl, ending with a scream like that of the peacock. I observed that the birds continued to lay from the latter part of August to March, when I left that part of the country; and, according to the testimony of the natives, there is only an interval of about four or five months, the driest and hottest part of the year, between their seasons of incubation. The composition of the mound appears to influence the colouring of a thin epidermis with which the eggs are covered, and which readily chips off, showing the true shell to be white: those deposited in the dry soil are always of a dark reddish-brown; while those from the sandy hillocks near the beach are of a dirty yellowish-white: they differ a good deal in size, but in form they all assimilate, both ends being equal: they are three inches and five lines long by two inches and three lines broad."  

*Birds of Australia.*
The night was spent in preparations, on both sides, for the fight that was to decide the fate of a kingdom. "After midnight the trumpet sounded in King Henry’s host, then every man made him ready; at the second blast they drew out of their lodgings, and ordered three battles." The first was principally under the command of Sir Bertrand du Guesclin, and there were all the strangers, as well of France as of other countries: "there was well in that battle four thousand knights and squires, well armed and dressed after the usage of France." The second battalion was under the orders of Don Tello and Don Sancho, brothers to King Henry; "and in that battle, with the genetors*, there were fifteen thousand a-foot and a-horseback, and they drew them a little aback on the left hand of the first battle. The third battle, and the greatest of all, governed King Henry himself; and in his company there were a seven thousand horsemen and three score thousand a-foot, with the cross-bows, so that in all three battles he was a four score and six thousand a-horseback and a-foot. Then King Henry leapt on a strong mule, after the usage of the country, and rode from battle to battle, right sweetly praying every man that day to employ himself to defend and keep their honour, and so he showed himself so cheerfully that every man was joyful to behold him. Then he went again to his own battle, and by that time it was daylight; and then about the sun rising he advanced forth towards Navaret to find his enemies, in good order of battle, ready to fight." Such is a view of the Spanish camp during that eventful night; turn we now to the English.

* Light horsemen mounted on jennets: whence the name.
behold the battles and the armours shining against
the sun; so thus they went forward till they ap-
proached near together. Then the prince and his
company went over a little hill, and in the descen
ding thereof they perceived clearly their enemies coming
toward the bridge; and when they were about a
foot's breadth down this mountain, then every man
drew to their battles, and kept them still, and so rested them; and every
man dressed and apparelled himself ready to fight.'

Then it was that the interesting incident which
forms the subject of our engraving occurred. "Sir
John Chandos brought his banner, rolled up together,
to Sir William, and said, 'Sir, behold, to such an end
now; I require you display it abroad, and give me
leave this day to raise it; for, Sir, I thank God and
you, I have land and heritage sufficient to maintain it
withal.' Then the prince and King Don Pedro took
the banner between their hands, and spread it abroad,
the which was of silver, a sharp pyle gules, and
delivered it to him, and said, 'Sir John, behold here
you own heritage, the which growth your fortune.'

Then Sir John Chandos bare his banner to his own
company, and said, 'Sirs, behold here my banner and
yours; keep it as your own: and they took it, and
were right joyful thereof, and said that, by the plea-
sure of God and St. George, they would keep and
defend it to the best of their powers; and so the battle
began a little to advance; and then the Prince of
Wales opened his eyes and regarded towards heaven,
and joined his hands together, and said, 'Very God,
Jesu Christ, who hath formed and created me, con-
sent, by your benign grace, that I may have this day
victory of mine enemies, as that I do in a rightful
quarrel; to sustain and to aid this king, chased out of
his own heritage, the which gives me courage to
foot, as long as I may see you do your devoir.' By advanc-
ing myself to re-establish him again into his
these words, and such other ful of comfort, King
John Chandos brought his men together again three times
the same day, and with his own hands he fought valiantly;
and so the battle was long and fiercely maintained, and
reduced to the prince, and said, 'Sir, behold here my ban-
ner; and in another, showed signs of dismay and disun-
ion. The fault was not in King Henry that they did no
better, for he had well admonished and desired them
to have done their devoir valiantly, and so they had
promised him to have done; the king bare himself
valiantly, and did marvellous deeds in arms, and with
Englishmen and Gascons should have had much more
to do, and have suffered more pain than they did.

As usual, the cloth-yard shafts called the enemy beyond
and red with the blood of men and horses that there
were slain.' Navaret was pillaged, as usual, and
among the rest King Henry's lodging, 'wherein they
found great riches of vessels and jewels of gold and
silver. The fallen Enrique had wisely taken a dif-
ferent route, by which he escaped; and it was fortu-
ate for him, 'for he knew well that if he were taken
he should die without mercy.'
tions with regard to his brother Don Sancho, and
many other of his subjects among the prisoners taken,
that Pedro wished to have had their heads immediately
after the battle, and was only persuaded from it by
the requests (now commands) of the Black Prince.

Sir John Chandos did that day for the Duke of Lan-
caster what he had before been accustomed to do for his
brother the prince: he introduced him as it were into
the greatest perils, and therefore honored of warfare,
keeping generally at his side, guiding and preserving.
The distinguished warrior's own career, however, had
nearly ended on this Spanish plain. Once "he adven-
tured himself so far that he was closed in among his
enemies, and so sore overpressed that he was felled
down to the earth, and on him there fell a great
and big man of Castile called Martin Ferrant, who was
greatly renowned of hardiness among the Spaniards;
and he did his intent to have slain Sir John Chan-
do, who lay under him in great danger. Then Sir
John Chandos remembered of a knife that he had
in his bosom, and drew it out, and struck this Martin
so in the back and in forty days, that he would not
have been able to recover him. Then Sir John Chandos
turned him over and rose quickly on his feet; and his
men were there about him, who had with much
pain broken the press to come to him whereas they saw him
killed." The Black Prince and his father would have
thought their victory dearly purchased if they had lost
Sir John Chandos, even although the number of killed
men no more than it was according to the almost
incredible statement of Froissart, four nights and
some forty others; whilst of the Spaniards and French
five hundred and sixty men-of-arms were killed, and
between seven and eight thousand others, exclusive of
those drowned.

Tenure of Land in Guernsey.—The tenure of property partsake
of the double nature of land held as a farm, subject to the pay-
ment of annual rents, and as land held as freehold in perpetuity.
A purchase may be made by the immediate payment of the
price agreed upon, or by the payment of a part only, and the
conversion of the remainder into own rents to be annually paid;
or finally, by converting the whole of the price into such rents.
In the last two cases, where a part of or the whole of the price
is stipulated for in annual rents, the purchaser is, to all intents
and purposes, as much the proprietor as in the first case, where
the whole price is paid down. In this case, the rents, whether
fixed or variable, are paid, and he his heirs can never be disturbed,
but hold the land as freehold for ever. This latter proposition
the purchaser the rents are guaranteed by the land sold, and by all the other
real property held at the same time by the purchaser free from
encumbrance, and the rents being transferred, is generally
considered as the perfect property being always in demand, money can be raised by their
sales with as much ease as it could before on the land itself.
Thus, without the necessity of cultivating the soil, the original
possessor enjoys the net income of his estate, secured on the
estate itself, which he can resume in ease of non-payment; while
the purchaser, on due payment of the rent charged, becomes
real and perpetual owner, having an interest in the soil far above
farmers under any other tenure. Experience has proved that,
encumbrance; and the rents being transferred, is generally
producing content, ease, and even wealth, from estates which,
in other countries, would hardly be thought capable of affording
sustenance to their occupants. And thus, also, arose two classes
mutually advantageous to each other: the one living on its in-
come, or free exercise of trades or professions—the other com-
oposed of farmers raised to the rank of proprietors, dependent
alone on their own good conduct. The facility of acquiring
land in perpetuity, without paying any purchase money, is un-
deniably proved to have been of infinite benefit to the people
of the island; but it is obvious that the same good could never have existed, or could never continue, without a
according security, well guaranteed to the original proprietor
of the land before he parted with it.—History of Guernsey, by
Jonathan Duncan.
THE PERCH.

"The bright-eyed perch with fins of Tyrian dye" is one of the most beautiful of our fresh-water fishes. The upper part of the body is of a rich greenish brown, passing below into hues of a golden yellowish-white. The common perch is the type of a family consisting of numerous species, some inhabiting the sea, but all more or less resembling the one found in England. It is probable that many species still remain undiscovered, as their geographical distribution is so extensive as to comprise the most opposite parts of the globe; North America, Java, and New Zealand, for example. There are few rivers, streams, lakes, canals, or ponds in England which are not inhabited by the perch, though, like the trout, it probably prefers clear and rapid streams, and haunts the moderately deep waters and hollows under the banks. It is a sociable fish, and swims in shoals. It is difficult to acquire accurate knowledge respecting the habits and economy of fish, and though a piscatorium affords facilities for observation, yet very patient habits of attention are required before anything can be added to the facts which are already known. In a piscatorium formed by Mr. Jesse at Bushy Park, "the perch," he says, "were the boldest and most familiar of any of the fish, as I found no difficulty in soon getting them with eagerness to take a worm out of my hand." Mr. Yarrell states that perch have been known to breed in a small vase. Like the carp, it possesses great tenacity of life when out of its natural element, and bears easily a journey of forty or fifty miles if refreshed occasionally with water and placed in wet moss. In some parts of the Continent the fish is taken from the ponds in the morning, carried to market, and if not sold, is restored to its proper element and home at night.

A perch of three pounds is considered a large size, but in Mr. Yarrell's work instances are mentioned of individuals having been taken weighing five, six, eight, and nine pounds. The one of six pounds was taken in the Birmingham canal; the two of eight pounds, in the Wiltshire Avon and in Dagenham Reach in the Thames; and the largest of all, said to weigh nine pounds, was reported on hearsay by Pennant as having been taken in the Serpentine. The average weight is generally inconsiderable. Mr. Turton, an experienced brother of the angle at Sheffield, mentions a case in which sixty perch were taken by the red-worm during a few hours one evening out of a reservoir near Chapel-en-le-Frith in Derbyshire, and their aggregate weight was sixteen pounds. Mr. Jesse states that "great numbers of perch are bred in the Hampton Court and Bushy Park ponds, all of which are well supplied with running water and with plenty of food, yet they seldom arrive at a large size. In a neighbouring pond, which is only fed with drainage water, I have caught very large perch. The perch in the Regent's Park are very numerous. Those I have taken, however, are almost invariably of one size, from half to three-quarters of a pound. Why they should have arrived at this size and not go on increasing in size is a circumstance which it is not easy to account for. I have, however, remarked it to be the case in other ponds." Perch spawn at the end of April or beginning of May, but Mr. Turton states March. A perch of half a pound weight has been found to contain two hundred and eighty thousand ova.

The season for commencing to fish for perch in
Walton's time was when the mulberry had commenced to put forth its buds. It is at all times very pleasing to have natural guides of this sort, and our ancestors had many such; and anglers still retain some of them. Walton describes the perch as "a very bold biting fish," and he relates that it was said of them by some one, that they were "like the wicked of this world, not afraid though their companions perish in their sins." "They show the greatest signs of vanity, avarice, and boldness prove their destruction. These qualities render the perch an easy prey to the young angler, and it is generally his first object of pursuit, until he becomes emulous of the higher skill of the fly-fisher. The flesh of the perch is firm, white, and of good flavour.

The enthusiasm of anglers has long been well known, and angling is one of the sports in which the inhabitants of towns are most wont to indulge when they display a taste for enjoyments of this kind. One of its best recommendations is its inexpensiveness; and though other sports bring a man into communion with nature, none does so in a way better calculated to benefit the mind or to leave it open to gentle and delightful impressions. In the Book of Sports, by the Lady Juliana Berners, published in 1496, and written some years before the preference is given to angling over other field-sports, and its peculiar enjoyments are set forth with earnest simplicity:—And yet he [the angler] at the least hath his wholesome walk and merry at his ease, a sweet air of the sweet savour of the mead flowers: that maketh him hungry. He follows the melanchous harmony of fishes. He seeth the young swans, herons, ducks, coots, and many other foul with their broods; which me seemeth better than all the noise of hounds, the blastsof horns, and the cry of fowls, that hunters, falconers, and fowlers can make. And if the angler take fish, surely then is there no intelligence reached the House that Knight, the Secretary, acquainted them that they had already dis

It would be impossible to describe the extent of the confusion, the misery, the utter looseness of all the bonds of confidence, which more than any laws keep up the harmonious movements of the social machinery,—or the universal desire for vengeance that pervaded all classes, now that the delusion had passed from before their eyes. Gibbon, the historian, whose grandfather was one of the Directors, has led the way in describing the injustice of the people and the parliament at that time, and the ordinary forms of justice in the punishment of the criminals. But was this an ordinary case? Could any statesman or lawyer have anticipated such conduct as was proved against such men? A gigantic system of fraud, which shakes the nation to its centre, is not to be looked upon as a petty larceny. It would be as reason able to suppose the vindictive length to which it would wait for the decision of the County Assizes before he determined on the fate of his prisoners. We can, accordingly, well understand the feeling of Lord Molesworth, even whilst we condemn the vindictive action of the law itself in his case. That noble lord is reported to have said, in his place in parliament, that it was stated "by some that there was no law to punish the Directors of the South Sea Company, who were justly looked upon as the authors of the present misfortune of the state. In his opinion they ought, upon this occasion, to follow the example of the ancient Romans, who, having no law against parricide, because their law supposed no son but be so unnaturally killed as to imbrue his hand in his father's blood, made a law to his honour, which was first proceeded against as it was committed. They adjourned the guilty wretch to be sewn in a sack, and thrown alive into the Tiber. He looked upon the contrivers and executors of the villainous South Sea scheme as the parricides of their country, and should be satisfied to see them tied, in the same manner, in sacks, and thrown into the Thames." They may serve also as a specimen of the feeling of the House and the country. Two objects now engaged attention: one, the re-establishment of the public credit in the best possible manner,—the other, the punishment of the men who had brought that credit to its lowest state. The first Walpole undertook. His ultimate measures consisted essentially of the graving upon the Bank of England stocks, and the stocks of the East India Company, large portions of the stock held by the South Sea Company, and remitting the bonus of seven millions which the latter had engaged to pay. The second,—the punishment of the criminal authors of all the mischief,—needed no leader: there were but too many ready to proceed like Lord Moles worth, even whilst we condemn the vindictive business. He felt that it was a train of the deepest villainy and fraud that had ever contrived to ruin a nation. Two thousand pounds reward was offered for the apprehension of the cashier, and some of the Directors were arrested, including Gibbon's grandfather and Sir John Blunt.

Our space will only allow us to give a summary of the astounding discoveries made by this committee. They stated at the outset that the Company's books they had seen were full of false entries, blanks, errors, and alterations, and others were missing or destroyed. They had, however, been able to detect the sale of fictitious stock (in the mode being pointed out) to the amount of at least 1,200,000l.; they had found that Charles Stanhope, Esq., the Secretary of the Treasury, had received a real profit on his assignment of fictitious stock of 250,000l., through the medium of George Couth, part of which had been altered to Stangate; that Mr. Aislabie, the Chancellor of the Exchequer, had accounts of profits evidently derived in a similar manner, with different brokers and merchants, to the enormous amount of 794,451l. James Craggs, the Secretary of State, died, professedly of the small-pox, at the very time of the publication of the report. Stanhope was first proceeded against, who escaped by a majority of three, on account of his relationship to the much esteemed Earl of Stanhope, who had been killed just before by this altogether melancholy business. In a discussion in the Lords the blood rushed to his head, and the next day he was a corpse. Aislabie's case followed Stanhope's, whose case was so bad that scarcely any defence was offered.
He was expelled the House, sent a prisoner from thence to the Tower, and ordered to make out a statement of his estate for the benefit of the stockholders of the Company. No sooner was this result known than London presented one universal blaze of bonfires. Sir George Craggs was next expelled the House, and ordered to refund the 250,000l. paid to Stanhope. The Earl of Sunderland was acquitted by a majority of 233 to 172, and demonstrations of a very opposite kind marked the dissatisfaction of the people.

The same day the elder Craggs, whose case was coming before the House on the morrow, took poison. We need not further follow this consideration of the Directors; all were gone through, and at the conclusion their entire estates confiscated, amounting to above two millions, for the benefit of their victims, with the exception of a small allowance left to each. Sir John Blunt, for instance, had 3000l. out of 183,000l.; Sir John Fellowes, 10,000l. out of 243,000l. Now we ask, reverting to what has been before stated, was not this substantial justice? It has been urged that no consideration was paid to the fact that some of the Directors left off poorer than they began; we do not think the circumstance deserved any consideration. Is the character of fraud lessened by the common fact that those who live by it often end in picking our pockets, and then send us to gaol for compound plaining? On the conclusion of the business, Parliament was prorogued with a speech of a consolatory tone, but not very well calculated to assuage the national anger. In our list of the persons about the Court who received assignments of stock we have before seen the names of the King's mistresses included. We have also noticed the Prince of Wales's profitable, however brief, connexion with one of the Directors. What, expect, then, must the nation have thought, when, seeing this, and suspecting much more, they read the following passage?—"The common calamily," said the King, "occasioned by the wicked execution of the South Sea scheme, was become so very great before your meeting, that the providing proper remedies for it was very difficult; but it is a great comfort to me to observe that the measure has been very satisfactorily taken to remedy it. . . . I have great compassion for the sufferings of the innocent, and a just indignation against the guilty; and have readily given my assent to such bills as you have presented to me for punishing the authors of our late misfortunes, and for obtaining the restitution and satisfaction due to those who have been injured by them." The Duchess of Kendal, however, remained a Duchess; and, with this proceeding, two of her foreign favourites, still appeared at the English Court, to excite the not unnatural jealousy of the English people.

London.

THE LONDON CANALS.

The only two rivers which may be said to have any immediate connexion with London are the Thames and the Lea: the former being in truth the "river of all nations." But the other a stream so small as to be comparatively insignificant. Yet in past times the navigation of the Lea was deemed a matter deserving of much parliamentary care. Even so far back as the fifteenth century attempts were made to render the Lea navigable down to London. But the first proposal to form a navigable canal in any respect resembling the Regent's Canal of the present day, was made about the year 1773, when Mr. James Sharp, brother to Granville Sharp, presented a memorial to the Corporation of London on the subject. He made choice of the North Norfolk, at that time an open area of ground, as a nucleus whence two canals might be projected, one north-east to the river Lea, and another westward to Paddington; the latter corresponding in some degree with the present Regent's Canal. Mr. Sharp, in a spirit which seems to have reflected high credit on his disinterestedness, employed Brindley and Whitbread, with a view to test the practicability of the plans. In these roadways, Mr. Sharp's views of the improvements in travelling and carriage likely to be effected by such plans may excite a smile; but we must try them by the standard of 1772, and not that of 1842, to determine their merit:—"The canal boat would contain four broad-wheeled wagons, which by inclined planes might easily be rolled into it. Each of these, by land, requires eight horses to draw them; whereas one horse would bring such a vessel as this, with four wagons," from Waltham Abbey to London in four hours; so that it is evident that the labour of thirty-one horses would be saved. And if so, all the heavy carriage from the north road might be removed from Cambridge, from Lynn, Norwich, and many parts of Norfolk and Suffolk, through Essex by Waltham Abbey, must come through the present proposed canal. . . .

The conveyance of passengers in boats and barges, neatly fitted up with accommodations of every kind, would be a matter of infinite consequence, both to the rich and poor of this city. It is a pleasure, delight, and profit; to the latter, comfort and rest from their labour, as well as passage at a very low rate, since persons may be expeditiously con-
vveyed fourteen miles and a half by this delightful communication for the trifling sum of threepence."

But this "delightful travelling" of rich and poor from Moorfields to the river Lea by canal was destined never to be brought about. The Corporation of London entered with much earnestness into the plan, for the prosecution of which they gave their full sanction; but when a bill was brought into parliament, to give the necessary powers to the City, certain interested parties opposed it so strenuously as to lead to the ultimate rejection of the measure. Thus fell a project which, if acted on, might have wrought considerable changes in the topographical and commercial features of the country. As it stood, however, and was delayed by difficulties, the 'Grand Junction Canal,' ninety miles in length, was completed. As a branch of or from this canal, the 'Paddington Canal' was projected, intended to bring merchandise from the 'Grand Junction' to the western extremity of London, a distance of fourteen miles. This being effected, the third and last step in the series of canals, an extension or branch of the one just named, was constructed from Paddington to Limehouse; thus completing the system of canal navigation now observable in the northern outskirts of London. Those who are familiar with these districts are aware that the Regent's Canal is by far the most important of any passing in or near the metropolis. It completely bounds the busy mass of London on the north, the north-west, and the north-east, forming a boundary in these directions more distinct than any other that can be named; although it must be confessed the time seems rapidly approaching when Poplar and Bromley, Bow and Old Ford, Hackney and Homerton, Dalston and Kingsland, Islington and Kentish Town, Portland Town and Paddington, will render this boundary little else than a name.

The most distinguishing feature of all canals is the lock. A heavy barge or boat passes down the canal, it enters an oblong basin or receptacle by an open gate, the gate is closed after it, a man turns a handle whereby a portion of water is made to flow from one cell of the basin to another, and the barge gradually descends; another door is wound up or opened in the lower gate of the lock, whereby the water in the basin is still further lowered, the lower gate is opened, and the barge passes smoothly onward. All this, which is effected in from three to five minutes, is calculated strongly to excite the attention of a stranger. There is nothing extraneous to it in land traffic, and we may not unprofitably pause to consider briefly the object and nature of the contrivance.

The physical law whereby a fluid tends to maintain a constant level, gives rise to this important question in canal engineering, how are inequalities of country to be surmounted? A turnpike-road may be carried over a hill, provided the gradients are not too steep; but no gradients are admissible in a canal, else the water would all rush to the lower end, and the canal would be, if anything, a 'rapid.' Yet acclivities must be surmounted by some means or other; and locks are now the chief contrivances adopted in this country for effecting the object. A profile of elevation, through its whole length would exhibit a succession of steps, placed at regular distances apart; each step serving to connect a perfectly level part of the canal with another part equally level, but several feet higher or lower; the average difference of level (in the Regent's Canal) being about seven feet at each step. A pound of the canal would be thus gained by each lock, and the traffic, and we may not unprofitably pause to consider the shawls called when free from ornament, is not often, briefly the object and nature of the contrivance.

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usaleh (the real), or the latter kind, could not be procured for less than 700 or 800 rupees. The productions of the Kashmirian looms, which are of old and unimproved construction, are very numerous: du shalah, or two shawls, they being always made in pairs; jamaweh, for bedding; rumal, or handkerchiefs; hasleyi, or the shawl of a coloured ground, being very small, the length being about one half the thickness of the common shawl, and which I was told was invented for the Sikh turbans. Besides the above, gowls, or gowlos, are manufactured in the plain of Hindustan, which are about to be constructed of this material. As the walls will

The finest pale yellow colour of a new shawl is given by means of sulphur fumes. A hole is made in the floor about a foot in diameter, and six inches in depth. Over this is placed a small chimney of poplar-wood, open, of course, above. Some lighted charcoal is put into the hole, and over it is sprinkled a small handful of bruised sulphur. Around the chimney, and about five feet distance from it, there are placed, one above another, about five feet six inches in height, upon which four shawls are suspended, and the external air is further excluded by another drawn over the top. When the sulphur is consumed, the shawls are withdrawn, and others are subjected to the fumes of fresh sulphur. They are kept for a few days, and then washed, hung up to dry, and pressed, several together, between two boards. The mokym, or broker, who transacts business between the shawl manufacturer and the merchant, is a person of great importance in the city, and the manner in which their transactions are carried on is rather singular. They have correspondents in most of the large cities of Hindustan, whose business is to collect and forward every species of information connected with their trade. By their means they seldom fail to hear of any saudagur, or merchant, who is about to start for Kashmir, even from such a distance as Calcutta, and, if he be a rich man, the mokym will send as far as Delhi to meet him, and invite him to become his guest during his sojourn in the valley. Perhaps, again, when the merchant, half dead with fatigue and cold, stands at length the famous summit of the Pir Panjal, either of the other mountain-passes, he is suddenly amazed by finding there a servant of the broker, who has kindled a fire ready for his reception, and a hot cup of tea and a kabab, a delicious kaliaun, and a note containing a fresh and still more pressing invitation. The chief civil officer of the town, Mokum, or broker, who has kindled a fire ready for his reception, pays him the compliment of seeing him safe to the outside of the city, and in one of these is a round hole, about a foot and a half in diameter, and a foot in depth; in this the shawl is placed, and water being poured over it, it is stamped on by the naked feet for about five minutes, and then taken into the canal, by a man standing in the water; one end is gathered up in his hand, and the shawl swung round and beaten with great force upon a flat stone, covered with a layer of soft earth, and should every beat be even and firm, is suspended and the external air is further excluded by another

THE PENNY MAGAZINE.

The best water for this use is found in the canal between the lake and the water-springs of Srinagar. Some ruins, in large limestone blocks, are lying on the washing-place, and in one of these is a round hole, about a foot and a half in diameter, and a foot in depth; in this the shawl is placed, and water being poured over it, it is stamped on by the naked feet for about five minutes, and then taken into the canal, by a man standing in the water; one end is gathered up in his hand, and the shawl swung round and beaten with great force upon a flat stone, covered with a layer of soft earth, and should every beat be even and firm, is suspended and the external air is further excluded by another

Cost-iron Buildings.—Buildings of cast-iron are daily increasing at a prodigious rate in England, and it appears that houses are about to be constructed of this material. As the walls will be hollow, it will be easy to warm the buildings by a single stove placed in the kitchen. A three-storied dwelling, not more than twelve rooms, will not cost more than 1100l., regard being had to the manner in which it may be ornamented. Houses of this description may be taken to pieces, and transported from one place to another, at an expense of not more than 235l. It is said that a large number of cast-iron houses are about to be manufactured in Belgium and England, for the citizens of Hamburg whose habitations have been burnt.—Mining Journal.
RAILWAY RAMBLES.

DROPMORE.

Looking in a northerly direction from the terrace of Windsor Castle, over the valley of the Thames, the eye rests upon a long line of elevated ground, terminating towards the west in a somewhat bold and abrupt promontory. This elevated ridge thus ending near Maidenhead is a very considerable table-land, including several parishes of great extent, for the most part ill repaying the labours of the cultivator, but of late years rendered most productive as well as picturesque by large plantations, chiefly of larch and the other species of pines. One of the most elevated and commanding situations near the western extremity of this table-land was, some fifty years ago, a wild common, in the parish of Burnham, about three miles from the great Bath road. Here the late distinguished statesman and scholar Lord Grenville had a property called Dropmore. He chose the place for his retreat from the cares of public life. The common was inclosed; plantations of pines were made with consummate taste; an elegant house was built; a flower-garden of surpassing beauty formed; and there are now few places in England so beautiful to the lover of fine scenery, and so interesting to the botanist, as the gardens and grounds of Dropmore. These are, with great liberality, shown to the public, without any formality beyond an application to the gardener; and certainly the object, in connexion with the fine natural scenery of Burnham Beeches, of which we have already spoken, is well worth a Railway Ramble. The visitor may either alight at the station at Maidenhead or at Slough; the village of Burnham being about two miles distant from each.

We extract the following account of the cultivation of the pine tribe in England from Mr. Loudon's most elaborate and accurate work, 'Arboretum.'

Several sorts of pines and firs appear to have been known in England in the time of Gerard and Parkinson; and afterwards Ray and Evelyn refer to gardens containing particular species. It had not then been common to farm plantations of the pine as a useful tree, for Evelyn mentions as remarkable, that a northern gentleman had informed him that the pine was abundantly planted in Northumberland for timber. Evelyn mentions ten several sorts as then in English gardens: including the cedar, and the larch, the pinaster, the Pinus Tæda, the silver fir, the spruce, and one or two other species or varieties of doubtful identity. In the 'London Nurseryman's Catalogue' of 1730, about the same number are enumerated as being then propagated for sale. In Miller's time, collections of pines and firs appear to have been first made by some of the principal landed gentlemen. Among the oldest of these collections was that at Woburn Abbey, where the park, at the beginning of the present century, contained some immense silver firs, that have since been cut down on account of their age. At Whitton, an excellent collection was made, between 1720 and 1730, by Archibald, Duke of Argyle: some fine specimens of which, and especially the cedars, pinasters, Weymouth pines, and hemlock spruces, still remain, and continue to grow vigorously. According to the 'Hortus Kewensis,' the Pinus Cembra was first planted at Whitton; and the original tree, which still exists, was, in July, 1837, fifty feet high, with a trunk one foot six inches in diameter. Between 1750 and 1760, Peter Collinson made a collection of all the rarest pines and firs that could be procured in his time, in his grounds at Mill Hill; and several of these trees, particularly Pinus Cembra, Pinus Tinea,
CHIMNEYS AND CHIMNEY-SWEEPERS.

The period seems to be not very far distant when the poor little chimney-sweeper, with his sooty face, his weak eyes, his bare feet, and his burden of soot, will be spoken of as a creature of other days—a memorial of a most clumsy and unscientific (not to say unlawful) system of sweeping chimneys. The loss of heat is, first, more than half which is in the smoke as it issues from the burning mass; secondly, that carried off by the current of the warmed air of the room, which is constantly entering the chimney between the fire and the mantelpiece; and thirdly, the smoke entering from the atmosphere which it can be detected, although large furnaces are in work; a by the termsof the Act, were to be betweencight and cest's notion of the industry, and a just appreciation of its importance; an early and most extensive knowledge of classical literature, which he improved, instead of abandoning, down to the close of his life; a taste formed upon those chaste models, and of which his lighter compositions, as well as those of his period, are a most expensive error.

When the circumstances are considered by which the sweeping of chimneys is rendered necessary, we cannot but lament the glaring neglect of scientific principles involved in them. If soot were a necessary product of combustion—if fuel, when burned, could not give off heat without yielding soot also, then we might legitimately confine attention to the best mode of removing the soot thus formed. But such is a serious and a most expensive error. Soot is not a result of combustion; it is fuel—useful carbon—actually wasted by being driven off into the atmosphere without being made to yield its heating effects. We have lately had to speak of a rectifying distillery, in which scarcely any emission of smoke from the chimney can be detected, although large furnaces are in work; a result which, besides being profitable to the proprietor and conducive to the sanitary interests of the population, is most instructive as showing what can be done. In such a case the soot, instead of being allowed to ascend the chimney, is made to pass over or through burning fuel, whereby it is itself burned; all the product being the gases resulting from combustion, and a very small portion indeed of useful carbon. That such a plan may, by judicious and gradual improvement, be introduced into private dwellings, we firmly believe; indeed the "Arnott Society," established by several additions from time to time. The best collections of old trees in the immediate neighbourhood of London, now (1837) existing, are those at Kew and London; but the most complete collection in England, and doubtless in the world, is that in the Pinetum at Dropmore, near Windsor, commenced by the late Lord Grenville, and every new species or variety is added, as soon as it can be procured. All the sorts of Abietianæ that are in the country are in the garden of the London Horticultural Society; but the plants there are, for the most part, of small size."

We may properly conclude this brief notice of Dropmore with an extract from Lord Brougham's masterly delineation of the character of Lord Grenville:—"The endowments of this eminent statesman's mind were all of a useful and commanding sort; sound sense, steady memory, vast industry. His acquirements were in the same proportion valuable and lasting; a thorough acquaintance with business in its principles and in its details; a complete mastery of the sciences, as well as those of a practical kind. Of late years a perfect familiarity with political economy, and a just appreciation of its importance; an early and most extensive knowledge of classical literature, which he improved, instead of abandoning, down to the close of his life; a taste formed upon those chaste models, and of which his lighter compositions, as well as those of his period, are a most expensive error."

As we are on the threshold of a system which will urge strongly on every one the expediency of producing as little useless smoke as possible, it may be interesting briefly to notice the steps by which the legislature has brought about this result. Humanity has been the guiding motive; but if cleanliness and the very last. His eloquence was of a plain, masculine, authoritative cast, which neglected if it did not despise ornament, and partook in the least possible degree of fancy, while its declamation was often equally powerful with its reasoning and its statement."* * *
for three, four, or five guineas, to the master chimney-sweepers. Female children had occasionally been employed, but not in London. The result of the investigation was, that the Society prepared a Bill, whose chief feature was the appointing of certain guardians and trustees, empowered to license and register all master chimney-sweepers within ten miles of London, and to provide some permanent employment for the apprentices when their indentures should have expired. This Bill passed the House of Commons, but was thrown out in the Lords; and no legislative interference seems to have been decided on for many years. The society, therefore, has resorted to the invention of a machine which should supersede the necessity of employing climbing-boys; a course which seems to have been the chief means of bringing about the recent changes.

In 1817 a Committee of the House of Commons was appointed to investigate the matter; and in their Report the importance of it, by repealing the act &c., the Committee remark:—"But it is not only the early and hard labour, the spare diet, wretched lodging, and harsh treatment, which is the lot of these children; but in general they are kept almost entirely destitute of education, and moral or religious instruction: they form a sort of class by themselves, and from that work being done early in the day, they are thrust into the streets to pass their time in idleness and depravity. Thus they become an easy prey to those whose occupation it is to delude the ignorant and entrap the unwary; and if their constitution is strong enough to resist the diseases and deformities which are the consequences of their trade, and that they should grow so much in stature as not longer to be useful in it, they are cast upon the world without any means of obtaining a livelihood, with no habits of industry, or rather, what too frequently happens, with confirmed habits of idleness and vice." The Committee examined builders, the more respectable master chimney-sweepers, inventors of sweeping-machines, and members of benevolent institutions; and the ultimate testimony of the noble words prefixed to the act of 1788, that three-fourths of all the metropolitan chimney-mops might be swept by machines already invented, as well and as cleanly as by boys, and that the remaining fourth could be cheaply altered. The final result of the investigation was, a recommendation on the part of the Committee, that the use of climbing-boys should be abolished by law.

To those who are not very familiar with parliamentary usages, it may appear strange that twenty-five years have been suffered to elapse before this measure has been adopted; but the ferment of politics, and the caution necessary in interfering with private trade, will account for the delay. In 1834 a step was made in the road to improvement, by repealing the act of 1788, and passing another more stringent. By the terms of the new act, no boy could be apprenticed to a chimney-sweeper at a less age than ten years; no chimney-sweeper could take an apprentice unless he (the master) were a housekeeper; every apprentice between ten and fourteen years of age was to have a leather cap, with a brass plate on which was inscribed the names of the master and the apprentice, and the date of the apprenticeship; to compel an apprentice or any other person to ascend a chimney with a view of extinguishing fire was to be deemed a misdemeanour; no boys were to be let out to hire from one master chimney-sweeper to another; boys were to have a trial of three years before apprenticeship; and if they then disliked it, the indentures were not to be signed; chimney-boys were to be built with attention to certain stipulations as to form and dimensions; and the boys were not allowed to call or hawk in the streets. This act, which was to remain in force till Jan. 1, 1840, greatly lessened the miseries of the poor boys.

At last, in 1840, was passed that act which is now in operation, and which will probably lead to many important improvements hereafter. The operation of the act of 1834 was further extended to July 1st, in the present year (1842) on which day the new act came into operation. By the terms of the new act the employing of climbing-boys is utterly interdicted, whether by ascent or descent, whether for extinguishing fires. No new apprentices are to be taken nor old ones retained under sixteen years of age; another mode of compelling the adoption of machines instead of sweeping-boys. The chimneys of houses hereafter to be built are restricted as to form and dimensions, with a view of facilitating the employment of machines in cleansing them.

It is observable that the act now in operation does not proceed on any principle of smoke-consuming contrivances. It meets the present state of practice, by affording the means of removing the soot which may accumulate in a chimney. But we may hope that the necessity for such precautions will become less and less, as the true principles of combustion become better known. Let us only work out to their full extent the sanitary effects of the machine. The inventors have shown to be practicable, and we may perhaps find that a metallic tube, four or five inches in diameter, will suffice for carrying off all the gaseous products of combustion, provided we get over the absurdity of throwing away valuable fuel in the form of smoke. If inventive ingenuity could bring about a general use of the same contrivance, then we may save a vast quantity of fuel, and almost entirely prevent the formation of soot, as well as of those floating particles, so common and so annoying in the atmosphere of all great towns, under the name of 'blacks.'

It does not appear that in England the trade of chimney-sweeping has been confined to any class of persons in particular, unless indeed the poor, the deserted, and the ill-used, from whom the apprentices have been mostly chosen, may be called a class. In France, however, the case is very remarkable. It is said that all the Parisian chimney-sweepers are either Piedmontese or Savoyards, who unite to the industry and pecuniary advantage of the chimney-sweepers, inventor of sweeping-machines, and manufacurers have shown to be practicable, and we may perhaps find that a metallic tube, four or five inches in diameter, will suffice for carrying off all the gaseous products of combustion, provided we get over the absurdity of throwing away valuable fuel in the form of smoke. If inventive ingenuity could bring about a general use of the same contrivance, then we may save a vast quantity of fuel, and almost entirely prevent the formation of soot, as well as of those floating particles, so common and so annoying in the atmosphere of all great towns, under the name of 'blacks.'

* There was a paper on this subject read at the late meeting of the British Association for the Promotion of Science at Manchester; and in the Report of the Metropolitan Improvement Society, just published, the importance of smoke-prevention is pointedly mentioned; and it is added that the Society have taken steps for the accomplishment of this desirable object.

Enormous Chimney.—The gigantic chimney of the St. Rollox chemical-works, Glasgow, is probably the highest in the world. It rises to the elevation of 436 feet above the ground, or 32 feet higher than the cross which surmounts St. Paul's Cathedral. The base of the surface of the ground is 40 feet 3 inches in diameter, from which it expands to the diameter of the summit. Two millions of bricks have been used in this remarkable structure, which is nearly 200 feet higher than the loftiest chimneys existing in the neighbourhood of Glasgow.
AFGHANISTAN.

AFGHANISTAN, a country to which public attention has recently been strongly directed, is situated between Persia and India. In Mr. Elphinstone's valuable work on the 'Kingdom of Caubul,' there is a general summary of the principal features of the Afghans, and their country, which, although of some length, we willingly extract, as it conveys a very lively idea of both, by one whose judgment and discrimination are entitled to the highest respect.

Mr. Elphinstone remarks, that "If a man could be transported from England to the Afghan country, without passing through the dominions of Turkey, Persia, or Tartary, he would be amazed at the wide and unfrequented deserts, and the mountains, covered with perennial snow. Even in the cultivated part of the country, he would discover a wild assemblage of hills and wastes, unmarked by enclosures, not embellished by trees, and destitute of navigable canals, public roads, and all the great and elaborate productions of human industry and refinement. He would find the towns few, and far distant from each other; and he would look in vain for inns or other conveniences, which a traveller would meet with in the wildest parts of Great Britain. Yet he would sometimes be delighted with the fertility and populousness of particular plains and valleys, where he would see the productions of Europe mingled in profusion with those of the torrid zone; and the land laboured with an industry and a judgment nowhere surpassed. He would see the inhabitants, following their flocks in tents, or assembled in villages, to which the terraced roofs and mud walls give an appearance entirely new. He would be struck at first with their high and even harsh features, their sun-burned countenances, their long beards, their loose garments, and their shaggy mantles of skins. When he entered into the society, he would notice the absence of regular courts of justice, and of everything like an organized police. He would be surprised at the fluctuation and instability of the civil institutions. He would find it difficult to comprehend how a nation could subsist in such disorder; and would pity those who were compelled to pass their days in such a scene, and whose minds were trained by their unhappy situation to fraud and violence, to rapine, deceit, and revenge. Yet he would scarce fail to admire their martial and lofty spirit, their hospitality, and their bold and simple manners, equally removed from the supleness of a citizen and the awkward rusticity of a clown: and he would, probably, before long discover, among so many qualities that excited his disgust, the rudiments of many virtues."

The Afghans are placed in another striking point of view by supposing them visited by the Anglo-Indian traveller. Such a one, Mr. Elphinstone remarks, "would be pleased with the cold climate, elevated by the wild and novel scenery, and delighted by meeting many of the productions of his native land. He would first be struck with the thinness of the fixed population, and then with the appearance of the people; not fluttering in white muslins, while half their bodies are naked, but soberly and decently attired in dark-coloured woollen clothes, and wrap up in brown mantles, or large sheep-skin cloaks. He would admire their strong and active forms, their fair complexions and European features; their industry and enterprise; the hospitality, sobriety, and contempt of pleasure which appear in all their habits; and, above all, the independence and energy of their character. In India, he would have left a country where every movement originates in the government or its agents, and where the people absolutely go for nothing; and he would find himself among a nation where the control of the government is scarcely felt, and where every man appears to pursue his own inclinations, undirected and
unrestrained. Amidst the stormy independence of this mode of life, he would regret the ease and security in which the state of India, and even the indolence and timidity of its inhabitants, enable most parts of that country to repose. He would meet with many productions of art and nature that do not exist in India; but, in general, he would find the arts of life less advanced, and many of the injuries of the barbarous nation, they were tainted with the vices common to all Asians. Yet, he would reckon them virtuous, compared with the people to whom he had been accustomed; would be inclined to regard them with other eyes and judge them a portion of his esteem.

The key to the fundamental political condition of the Afghan people is to be found in their distribution in tribes. They trace their origin to Kyse Abdooreshed, probably a fabulous ancestor, who is represented as having been a descendant of Abraham; but the question of the connection of the Afghan people with the Semitic stock is not settled. Mr. Elphinstone states that "the tribes continue in a great measure unmixed, each having its territory compact;" and that the descent of the heads of the several tribes has been established by written records of the ancient period. The Afghan tribes, like the Persians and Indians, are divided into four branches, each branch being further divided into a number of tribes, each tribe being under the head of its eldest branch; but when the nation spread over an extensive country, the tribes of the same division began to be remote from each other, their connexion loosened, and each tribe remained at last under its own hereditary chief, entirely independent of the common head of the race. These tribes or independent branches he regards as so many "clannish commonwealths," and the authority of a common sovereign unites them into one state. The royal prerogative extends to the levying of troops and revenue infixed proportions from each tribe, and the distribution of the surplus to the tribes. The independence of the tribes is derived from a real ownership of the soil, and the dependence of the tribesmen on the sovereign is purely nominal. The laws are adapted only to the rudest state of society, and the notion that it is every man's right to do himself justice leads to acts of retaliation, constant feuds, and bloodshed.

Mr. Elphinstone in 1809 estimated the population of Afghanistan at fourteen millions, consisting of Afghans, Persians, and Indians; the Afghans forming more than three-fourths of the whole population. The large towns are chiefly inhabited by Persians and Indians, as an Afghan never keeps a shop or exercises a trade. Many of the western tribes live entirely in black coarse woollen tents, and migrate from place to place with their flocks. The dwellers in houses are, however, the most numerous part of the Afghan population, and agriculture is extending.

The history of Afghanistan is remarkable for the number of conquerors who have from time to time ruled over the country, though their sway may in many cases have been but little felt by the great body of the people. In the tenth century a chief of Khoressan conquered the country, and made Ghiznee the seat of his government. Two centuries afterwards a chief, named Baber, conquered the country, and when his son, Dost Mohammed, ascended the throne, the Persians received a new master, and were reduced to the condition of tributaries to the ruler of the Punjab. Such was the state of Afghanistan in 1836.

In the above year the Anglo-Indian government complained that Dost Mohammed Khan, chief of Caboul, had engaged in schemes of aggression which threatened the stability of the British frontier in India; and Sir Alexander Burns, who was sent with authority to represent to him the light in which his proceedings were viewed, was compelled to leave Caboul without having effected any change in his conduct. The siege of Herat, and the support which both Dost Mohammed and his brother, the chief of Candahar, gave to the Persians, excited the anger of Afghanistan, the latter chief especially openly assisting the
operations against Herat, created fresh alarm in the Anglo-Indian government as to the security of our frontier. Several minor chiefs also avowed their attachment to the Persians. As our policy, instead of hostility, required an ally capable of resisting aggression on the western frontier of India, the Governor-general, from whose official papers we take these statements, "was satisfied," after serious and mature deliberation, "that a pressing necessity, as well as every consideration of policy and justice, warranted us in espousing the cause of Shah Shooja ool Moolk;" and it was determined to place him on the throne. According to the Governor-general, speaking from the best authority, the testimony of Shah Shooja's popularity was unanimous. In June, 1838, the late Sir William Macnaghten formed a triumvirate treaty with the ruler of the Punjab and Shah Shooja; the object of which was to restore the latter to the throne of his ancestors. This policy it was conceived would conduct to the general freedom and security of commerce, the restoration of tranquillity upon the most important frontier of India, and the erection of a large extent of hostiles into faithful and obedient subjects; and while British influence would thus gain its proper footing among the nations of Central Asia, the prosperity of the Afghan people would be promoted.

Troops were despatched from the Presidencies of Bengal and Bombay to co-operate with the contingents raised by the Shah and our ally, the object of the force being intended to act together under the name of the 'Army of the Indus.' After a march of extraordinary length, through countries which had never before been traversed by British troops, and defiles which are the most difficult places in the world, where no wheeled-carriage had ever been, and where it was necessary for engineers in many places to construct roads before the baggage could proceed, the combined forces from Bengal and Bombay reached Candahar in May, 1839. According to the official accounts, the population were enthusiastic in welcoming the return of Shah Shooja. The next step was to advance towards Ghiznee and Caboul. On the 23rd July, the strong and important fortress and citadel of Ghiznee, regarded throughout Asia as impregnable, was taken in two hours by blowing up the Caboul gate. The army had only then forty-eight hours before the place. An 'expulsion party' carried three hundred pounds of gunpowder in twelve sand-bags, with a hose seventy-two feet long, the train was laid and fired, the party had time to reach tolerable shelter from the effects of the concussion, though one of the officers was injured by its force. On the 7th of August the army entered Caboul. Dost Mohammed had recalled his son Mohammed Akhbar from Jellalabad with the troops guarding the Khayer Pass, and their united forces amounted to thirteen thousand men; but these troops refused to advance, and Dost Mohammed was obliged to take precipitate flight, accompanied only by a small number of horsemen. Shah Shooja made a triumphant entry into Caboul, and the troops of Dost Mohammed tendered their allegiance to him. The official accounts state that in his progress towards Caboul he was joined by every person of rank and influence in the country. As the tribes in the Bolan Pass committed such outrages, and their number increased so rapidly, the Khelat (Khelat) was taken on the 13th of November, 1839. The political objects of the expedition had now apparently been obtained. The hostile chiefs of Caboul and Candahar were replaced by a friendly monarch. On the side of Sinde and Herat, British influence was conciliated, protection were conferred. All this had been accomplished in a few months, but at an expense said to exceed three millions sterling.

Two years afterwards the scene is suddenly reversed. On the 1st of November, 1841, the city of Caboul rose against the British and Shah Shooja; several officers, including Sir Alexander Burnes and his brother, were murdered. Our troops, amounting to between five and six thousand men, were ill supplied with provisions, and after conflicts kept up at intervals for many days they were unable to put down the revolt, which was at length headed by Mohammed Akhbar, son of Dost Mohammed. A negotiation was now thought necessary, and Sir William Macnaghten, the British envoy, with four officers, and a small escort, met Mohammed Akhbar on the 23rd of December, when the latter in the course of the discussion drew a pistol and shot the envoy. The extremities of the garrison led to a convention, concluded on the 5th of January, in the present year, under which the troops were to be allowed to march in safety to Jellalabad; but their cantonments were scarcely abandoned when they were attacked by their faithless enemies. The march soon became a retreat. The snow was deep on the ground, the season inclement, and the troops had to fight their way surrounded by hostile tribes and the frantic and fanatic Ghazees. Before them were the most terrible passes, in which it was not possible to offer a resistance. In the Khoord Caboul Pass, the British and Indian troops, amounting, with camp-followers, to about thirteen thousand men, were massacred, scarcely half-a-dozen ever reaching Jellalabad. Several ladies and officers taken as hostages were marched back to Caboul soon after the commencement of this frightful retreat. In March of the present year the garrison of Ghiznee, who had also withdrawn under a convention, were cut to pieces in the same way. Afghanistan is again the scene of military operations, and troops from Persia have repulsed the Afghan forces which shut up in Jellalabad, after marching through the Khyber Pass, about twenty-eight miles in length, and which is one of the most difficult in the world as a line of military defence. Shah Shooja has been murdered, and dissensions have sprung up amongst the Afghans.

We give a view of Jellalabad, which is on the high road from India to Caboul, and in another paper shall offer some account of the place.

- The london canals.

(Continued from page 319.)

But the lock is the more generally employed contrivance for changing the level of a canal. A lock is either single or double; the former being the more simple of the two. A single lock is an oblong chamber or basin connecting two 'pounds' or 'reaches' of a canal, the one on a higher level than the other; and the water in it being so constructed that the water in it coincides either with the upper or the lower level. At each end of the chamber, or basin, is a pair of gates, closing nearly water-tight across it, and provided with sluices, or doors, which, when opened, allow water to flow from the higher to the lower level. When a boat is about to descend the canal, it enters the lock at a time when the upper gate is closed and the lower opened; the water in the lock is on a level with the upper reach of the canal. The upper gates are then closed, and the sluices in the lower gates opened, whereby the water flows from the lock into the lower reach until both are on the same level; the lower gates are opened and the boat proceeds on her way. In raising up the canal the proceedings are of course reversed. But it will be seen that a large body of
water must be transferred from the upper to the lower level every time that a boat passes the lock; and to obviate a portion of this waste double locks are provided in many canals, such as the Regent's. In a double-lock, the boat descends. The boat passes to the full lock, and all the four pairs of gates are closed. The central culvert is then opened, by which half the contents of the full lock passes into the empty one, until both are at the same level. The boat has thus made half the required descent, and the other half is effected by opening the sluice in the lower gates of the lock containing the boat.

The canal proprietors are paid by a toll of so much per ton on all goods carried per canal; estimated, not at the weight of the laden boat and barge, but of the goods contained therein. As this load sometimes amounts to sixty or eighty tons, all the ordinary modes of weighing become unavailable; but a system has been established by which the area is divided into Latin, simplicity and correctness. In the first place, a new barge or fly-boat, when first used in a canal (we speak of general but perhaps not universal practice), is taken to a kind of covered dock, capable of being enclosed all around; and the number, name, owner's name and residence, date of construction, &c., are entered in a book. The gauge-master fixes four plates of iron on four parts of the barge, two near the head, and two near the stern, and in such places that all shall be at equal height above the water. This height is measured in inches and tenths with great accuracy, and recorded in the book in connexion with the name and number of the vessel. Two tons of leaden or iron weights are then put evenly in the barge, which of course sinks a little deeper; and the 'dry inches,' or distance from the surface of the water to each of the four plates, is again measured and recorded. Two tons more are added, and the result again recorded; and so on until the barge has been laden to an extent equal to any burden which it is afterwards likely to carry. The principle of proceeding at the subsequent passage of the barge past the weigh-house, will now be understood without much difficulty. Suppose, as an instance, that a boat or barge marked No. 100 in the Company's books arrive at the weigh-house in its passage with a cargo of goods, and that it is found on gauging to have twelve 'dry inches' below the guide-plates; on referring to the books, it is found that the large No. 100 sinks to twelve dry inches with a load amounting to a certain number of tons; and an inference is drawn that a load of that amount is at that time in the barge. As the empty barge is re-weighed after any alterations or repairs which tend to change her weight or floatage, and as considerable accuracy is attained in the mode of gauging the barge when laden, the gauge-master is at all times able to estimate the burden within about a quarter of a ton; the smallest quantity distinguished in canal charges. The gauge-rod is often a hollow tube, containing a light body which will float upon the surface of the water, and a graduated stem so adjusted as to obtain the measurement with facility and correctness.

Such is the general practice of gauging the laden barges, subject to slight modifications in different localities. A laden barge, passing either way along a canal, is at the discretion of the Company weighed or gauged, and a 'permit' or 'pass' given to the barge-

man; while the tonnage, and the toll payable for it, are entered against the proprietor of the barge. The weigh-houses are so placed in the line of canal as to take cognizance of all the traffic.

At the wharf of Messrs. Pickford and Co., in the City Road, can be witnessed, on a larger scale than at any other part of the kingdom, the general operations connected with canal traffic.

This large establishment nearly surrounds the southern extremity of the City Road basin. From the coach-road we can see little of the premises; but on proceeding to a street in the rear we come to a pair of large folding gates opening into an area or court, and we cannot remain here many minutes, especially in the morning and evening, without witnessing a scene of astonishing activity. From about five or six o'clock in the morning waggons are pouring in from various parts of town, laden with goods intended to be sent into the country per canal. In the morning, on the other hand, laden waggons are leaving the establishment, conveying to different parts of the metropolis goods which have arrived per canal during the night.

On entering the open area we find the eastern side bounded by stabling, where a large number of horses are kept during the intervals of business. In the centre a spacious area is kept to in many canals, such as the Regent's, in a double-take cognizance of all the traffic. In a double lock there are two oblong, chambers, eight or ten in number of these, all belonging to the firm, are kept up for the management of the canal traffic; besides another list relating wholly to railroad traffic. At all of these places the whole commercial machinery of a carrier's establishment is maintained; so that a cargo of goods dispatched from Messrs. Pickford's wharf in London is consigned to theirown servants at the particular country station, and thence directed to the different towns intended.

Hence arises a most extensive system of correspondence and supervision, in which all the branch establishments look up to the parent establishment in London. In one of the offices of the counting-house, for example, the wall is covered by folios or cases, each inscribed with the name of one particular district, and each devoted to the reception of letters, inquiries, and other communications from the managers of the branch establishment to which it relates. In another department of the counting-house, with its own particular corps of clerks, are managed all the transactions respecting the horses, provender, boats, and waggons. The number of these, all belonging to the firm, is enormous; and every direction concerning them, whether relating to purchase, repair, or general management—whether relating to the parent establishment, or a branch establishment two hundred miles distant—emanates from this office. In another department is managed all the business relating to charges and disbursements; the rate of charge to be made at the branch establishments, and the general transactions between the firm and their customers. In a fourth department are managed all the transactions between the firm and the canal owners throughout England. The firm have stations on probably thirty or forty different canals, the proprietors of which establish rates of tonnage and
An Arab Town in Algeria.—We find the following description of the Arab town of Tebessa, of which the French have recently taken possession, in a despatch addressed by General Negrier to the minister of war:—"The town of Tebessa, the ancient Thevessa of the Romans, is one of the finest parts of the province of Constantine. It stands at the foot and on the north side of the mountains of Bou Romann, which inclose the basin of the Oued Chabro, a tributary of the Oued Meklaha from the right. Here are to be found delicious water, beautiful gardens, and an immense plain irrigated by numerous springs, discharge from the great lake of the tarrakesh, situated along the bottom of the valley. The numerous ruins and traces of Roman stations scattered around the monuments of art found in Tebessa itself, and the other testimonials of grandeur and luxury still apparent, attest the value set by the Romans on this part of their conquests, and that the number of not more than one thousand five hundred Arabs, there existed in those times between thirty thousand and forty thousand inhabitants. The Roman fortress of Thevessa is still standing. It consists of a rectangular area of nearly equal sides, and surrounded by a wall measuring one thousand five hundred yards in extent, built of squared stone. At different distances in the line of the wall are fourteen square towers, four of which stand at the angles, and the rest with irregular spaces between them. There are at each side of the castle, or the ancient tower, and only two opposite its eastern and southern sides. The height of the wall varies from fifteen to thirty feet, and that of the towers from thirty to thirty-six feet. The thickness is between six and eight feet. There are two entrances, which the Arabs call Bab el Djaidil (the new gate), and Bab el Jall (the old gate). The first gives access to the town between the two towers fronting the east, which is scarcely wider than between ten and twelve feet. The other gate is surmounted by a triumphal arch, in the style of the best period of the Roman domination, and with columns cut in travertine, and with carvings separate in different parts. The building is of the Corinthian order, and all its architectural decorations are as fine as if they were sculptured yesterday. They are in remarkable perfect and delicate style. Latin inscriptions record the date of the original construction, and of its restoration, after being devastated by the barbarians. One of the inscriptions is very large and plain characters. Another inscription, a little above the Arab gate, in smaller letters, several of which are illegible, is of a more recent date, and relates that the first Thevessa, built by the Romans, and destroyed by the barbarians, was raised from its ruins by the emperor Constantine after the expulsion of the Vandals of the north of Africa. Inside the town, near the old gate, is a small temple still perfect, the form and architectural style of which much resembles the Maison Carée at Nimes. The height of this temple is thirty-five feet four inches from the ground, in its present state. Its length measures forty-seven feet six inches, and the width of the portico twenty-nine feet ten inches. This building is of the Corinthian order. The portico is composed of eight columns, surmounted by an entablature with a cornice, and an attic enriched with very curious architectural designs, executed with the utmost perfection. The columns are formed of single blocks of a very fine red marble. The rest of the temple is supported by pilasters in the same style as the portico. Towards the south-east of the town, at about two hundred yards from the new gate, is a circus of elliptical form, 180 feet long, an abundant stream of water, which the Romans conveyed into the town by an aqueduct seven hundred and sixty-five yards in length. It still exists across a ravine fifty feet in depth. In some parts it has been roughly repaired by the Arabs. It is the Roman canal which still brings to Tebessa all the water required for the inhabitants and their gardens. At about one thousand three hundred yards from the north wall of the town are immense ruins, supposed to be those of a temple of Justice, but it belongs to antiquaries alone to determine the destination of each of its parts. [To be continued.]"
ROMAN PEASANTRY.

Bartolommeo Pinelli, who designed the various groups of brigands which are so well known, delineated with the same spirit and truthfulness the sports and pastimes, the costumes and the striking customs of the peasantry of the Roman states, where, in many respects, the living population bear the impress of antiquity, and are probably but little changed from what the people were.

"When He from Troy Went up the Tiber."

The difference in costume between one district and another leads back to the time when the Campagna of Rome, and the hills that gird it, were divided into a number of small, separate, and independent states; and in some few cases it marks as clearly the extent of those miniature republics, or patriarchal kingdoms, as they could be marked by Cluverius or the most learned on the subject of ancient geography. Each of these districts preserves its own costume distinct from that of its neighbours, and not the slightest change or variation is allowed in it. What we call 'fashion' is an arbiter utterly unknown among the peasantry of the south of Italy. Every man, and every woman too, dress precisely as their father and mother had done before them, and as their progenitors had dressed for ages. In some of the most rural districts there seems to have been scarcely the slightest change either in fashion or material since the days of the Caesars, or the days of the first consuls, or the still remoter times of the kingly rulers: the coats of the men are undressed sheep-skins with the fleece on them, and the rest of their attire is made of flax cultivated in their own fields, spun with the distaff, and wove with a loom quite as simple as any that could have been in use even in the days of Homer, by their own women. In several parts of the Campagna of Rome the dresses of both sexes are identically the same as we see represented in bassi-rilievi and other sculptures in the Vatican, or in the great gallery at Florence, or in the splendid museum at Naples, so rich with the spoils of Herculaneum and Pompeii. The same antiquity or identity of costume is found in innumerable districts of the Neapolitan kingdom; but the most striking instance we remember was one that fell under our own observation at Paestum. In making some slight excavations near those glorious old temples—

"They stand between the mountains and the sea; Awful memorials, but of whom we know not!"

that were ancient edifices before the time of the first of the Caesars, the workmen discovered a great many female figures beautifully executed in fine clay, or terra cotta, and the costume of these figures, which must have been lying buried at that spot for some two thousand years, was the same, without the slightest variation, as the dress of the living female peasantry of the district. Thus in traversing the country which was anciently

* Rogers's 'Italy.'
the abode of the Lucanians, the Brutii, the Apulians, the Samnites, the Volscians, the Latini, the Veians, c., the traveller may fancy that the thin and scattered population present to the eye nearly the same appearances as the occupants of those regions presented to their Roman conquerors centuries before the Christian era; may, in the midst of ruined temples and amphitheatres, aqueducts and tombs, flatter his imagination that all things have not perished under the tooth of time; that the most ancient customs have been preserved, in spite of foreign conquests, wars, and devastations; the heart and affections of man, his pre-dilections and habits being so much stronger than the strongest work of his hands.

In the present design, Pinelli, as he usually did, unites a custom with costume. The little children in the basket, carried on the heads of the two female peasants, who might pass for Roman wives of the time of Cornelia, the mother of the Gracchi, are placed and carried in a manner peculiar to one or two districts only of the Campagna of Rome. At least we never observed the curious practice in any other part of Italy. In the basket is placed a mat made of that grows on the yellow Tiber, or the streams with classical names that fall into it, or that in too many cases run wild over the solitary waste, to form the Pontine marshes and malaria, are lined inside with rough cotton or uncombed wool, that the little bantlings may lie softly and comfortably, while, to prevent their throwing themselves out, the basket is crossed at the top by narrow bands of platted straws or small osiers. The little urchins, in short, are secured nearly in the same way as our stone jars are secured in hampers. With her infant on her head in one of these curious baskets, a paesana will trudge for miles to fair or market, or to take part in the labours of the field, much too large a portion of which falls to the women's lot in Italy; or to attend divine service on a Sunday or saint's day. We have seen them, when the infant has been sleeping and perfectly still, take theirdistaffstfrom their girdle, and go along spinning and singing, balancing the basket on their heads without any help from the hands, and apparently without any exertion. Water is nearly always carried home from the fountain, or the river, in the same manner; and then the hands are never used except to put the vase or vessel upon the head. The women of India have this last fashion of carrying water; and various English artists have delineated their graceful elastic forms, and the easy and seemingly instinctive way in which they balance and carry their large light vessels. In the south of Italy, osier baskets are frequently seen. They are lined insidewith rough cotton or uncombed wool, and nothing can exceed the case and gracefulness of those who are seen bearing them. The material is generally of the coarsest kind; but would that our Staffordshire potters adopted their elegance of forms!

There was one fine young woman that we used frequently to notice at Rome some years ago. She was what they called, in their language, which calls almost everything by a fine or sonorous name, a Corriere, or Courier, her occupation simply being to bring letters, or messages, or small parcels, or a basket of fowls or quails, as it might be, from a village at the foot of the hills, an offset of the Apennines, a canal back from Rome other letters, messages, or parcels. She was, in short, postwoman and carrier united, and the only medium of communication between her lonely village and the eternal city. Twice or thrice a week, under the burning sun of July, or under the deluge-like rains of September, she would roll along her little donkey's back from and to Rome, her village being some sixteen or eighteen miles from the city, and always she carried her last-born child in the basket on her head, disposing of all her other articles in a light open wicker basket which she carried in her hand. The poor creature (but we doubt whether the term ought to be applied to one possessed of ruddy health, a laughing eye, a most buoyant and queen-like step, and a look that seemed to say, 'Labour is light when we toil for those we love') used, on arriving at the city, to suckle her child by one of the gates, those large gates which the entrance of an old woman, and go and execute all her little commissions. Generally, in the evening of the same day she was seen taking her departure, loaded as she came, with her little one on her head, her wicker basket in her hand, and the traveller's benison going with her—'May the blessed Virgin accompany thee on thy road!'

THE LONDON CANALS.

[Concluded from page 328]  

At the hour of six or seven in the evening the scene which we have just described is presented in its busiest phase. As a general rule, all merchandise received during the day is re-exported by the evening. The canal traffic, and as the goods are not brought to the wharf until toward evening, all the operations of loading and unloading are then carried on with great celerity. Each wagggon, as it arrives, draws up by the side of the raised platform; the crane is set to work, the packages and boxes are taken out; the clerks and warehouse-keepers prepare the requisite entries and invoices; the goods are wheeled across the platform to the edge of the canal; and the boatmen assist in stowing them away in the boats. There may be half-a-dozen boats dispatched in the same evening, all to be filled subsequent to the arrival of the laden waggons at the wharf at five or six o'clock. It is from this circumstance that nearly all the fly-boats leave the wharf late in the evening—sometimes at midnight—after the busy operations of the day are completed. The 'captain,' or chief boatman, receives orders as to its destination and proceedings; and he consigns the goods to the managers of the establishments at the country towns, from whence the goods are forwarded to the consignees.

Let us, as in the case of the nature of canal traffic, suppose that a Manchester manufacturer forwards a cargo of cottons to London by canal through the same agency. They are placed in charge of Messrs. Pickford's agents at Manchester, by whom they are dispatched to London in a fly-boat; daily information being conveyed from the country agent to the town establishment of the works is received at Manchester, and the works are informed that their goods are on their way. The boat arrives at the City Road basin, generally in the evening or during the night; and it remains untouched till the business hours of the next morning. It is then drawn up to the side of the 'discharging warehouse,' where a crane speedily removes the cargo. Each package, after being weighed, compared with the invoice, &c., is placed in one or other of the rate groups. These groups do not relate to the places whence the goods have been brought, or the barge by which brought; but to different districts in London, and to the waggons or waggons going to those districts. All the boats which may have arrived since the preceding morning are thus unladen, the contents classified, and waggons drawn up for this purpose to the side of the 'discharging warehouse' are laden, each one with the packages consigned to one particular district. The waggons are then dispatched, and the boats wait till a return cargo is ready.

It may easily be imagined that as every package is registered in book and in invoice, bills and other documents, with great strictness, the amount of business transacted during the morning and evening is very extensive; while the middle of the day is occupied by
other transactions of a general character. Sometimes a package, or cargo of packages, is directed to be warehoused at the wharf till called for; and for the accommodation of these a large area of the building is appropriated. In walking through these warehouses, goods of a multifarious character may often be seen, according to the circumstances of trade at the moment; Cheshire cheeses, bales of cotton goods, spades, barrels of ale and cider—indeed, all kinds of commodities are occasionally required to be warehoused for short periods, each warehouse being devoted to a particular class of goods.

As the waggons and horses for the land transit belong to the firm, so do the boats also. Each boat is managed by three or four men and boys, of whom one is the principal, and is called the 'Captain' of the boat. Into his charge is placed the cargo; he receives a certain sum for the boat, and a certain sum for the canal miles, and out of this sum he pays his assistants. The proprietors fit up the little cabin which serves for 'parlour and kitchen all,' but the men supply their own provisions. The open barges which are to be seen on the Regent's Canal do not belong to Messrs. Pickford, they are the property of the merchants who deal in coal, iron, and other heavy materials, and who have wharfs on the banks of the canal and its basin. Most of the coal is brought from colliers lying in the Thames, through the Limehouse basin into the canal; but some is brought down the canal from the Midland Counties; and is also a considerable quantity of stone, lime, &c.

The period at which this article was written enables us to offer a word of information respecting the 'Annual Stoppage' on canals. It may readily be conceived that in undertaking involving so diversified an assemblage of parts, so incessant a wear and tear, as a canal, repairs and reconstructions must be required at intervals. The locks may become out of repair; the brick-work of the tunnels and bridges may be defective; the bed of the canal may be choked with sand and silt at particular spots; the steam tug may require overhauling; the barges and fly-boats may need inspection. In short, a general supervision may become necessary. Many such repairs as these require that the channel should be emptied of water at particular spots; a course which causes a temporary cessation of the customary traffic. In consequence, then, that this stoppage may produce the least amount of inconvenience to canal carriers and the commercial world generally, the directors of most English canals select the same period of the year for the annual examination, dredging, and repairing. During the second week in June, for example, in the present year, the Regent's Canal, as well as many (we believe most) others throughout England, was 'stopped.' Whoever, during that week, happened to visit the canal near the eastern end of the Islington tunnel, or near the gasworks at St. Pancras, or near the locks at the Hampstead Road, might have seen the canal nearly dry at those parts, and men busily engaged in digging out mud and sediment which had been found to impede the navigation. A portion of the canal is in such case cut off from communication with the main line, by a barrier of boards placed across it at either end, and the contained water is drawn off. Where it can conveniently be done, the barrier is fixed under one of the bridges, or in some other part where the canal presents a small width. The contained water is discharged through a water-tight system of boarding. The water is drained off by siphons and steam-engines, and the enclosed area, on the principle of a coffer-dam, is kept empty until the repairs are completed. The barriers are then removed, and the water from the higher parts of the canal flows in to fill up the void. The whole arrangements are so planned as to enable the commencement and the termination of the stoppage to take place at appointed periods, and some times of the year, during periods, each warehouse being devoted to a particular class of goods.

ON RIVERS, GEOGRAPHICALLY CONSIDERED.

RIVERS are the flowing waters, which bring to the sea, and sometimes to a lake, the waters which are collected within a certain portion of the earth's surface. The country which is thus drained by a river is called its basin, as the river runs in the lowest part of it, and the country rises on all sides with greater or less steepness, in the fashion of the sides of a basin. The margin of such a basin generally lies contiguous to the basin of another river, and thus constitutes the boundary-line of the two basins. From these margins the waters descend on both sides towards their respective basins, which are separated by them, and hence the whole line of these margins is called a watershed. The basins of rivers vary in shape and size. A brook is the name commonly given to rivers of the smallest description. When such a river rises near the sea or near a large river, into one of which it flows after a short course, it consequently drains a very small surface. If the waters should be increased by those of another brook, the name of brook is changed for that of rivulet. The basin of a rivulet is therefore more complicated than that of a brook. One or more brooks may descend from the margin of the basin, and by uniting their waters with those of the rivulet, increase its volume. When several rivulets unite and so produce a considerable volume of running water, this water-course takes the name of river. But all such rivers do not reach the sea or even a lake; most of them join other rivers, and thus a large river is produced. This last-mentioned large river is called the principal river, and those which increase its waters are called, with respect to it, affluents or tributaries, and sometimes feeders or branches.

The first waters of a river are generally derived from a spring, which breaks out at the foot of a declivity, or on the side of some hill or mountain; and sometimes from a swamp or a lake. This is called the source of a river. From this source the river descends through the lowest part of its basin until it terminates its course in the sea, a lake, or another river, and this termination is called the mouth of the river. The cavity in which the running water flows is called the bed of the river, and the solid land which bounds this bed is called its banks. It was formerly thought that the elevation at which a river originates must be in proportion to the length of its course, and accordingly geographers assumed that there are elevated mountain-ranges in those regions where large rivers take their rise; but modern researches have shown that this is not always the case. Thus the Volga, which is the largest river of Europe, and runs above two thousand miles, rises in a district the most elevated part of which does not exceed 1100 feet above the sea; and the Mississippi, which is still larger, originates in a tract which can hardly be called hilly, and at an elevation probably not much exceeding 1500 feet above the sea.

But still most large rivers have their origin in very elevated mountains or on high table-lands, in descending from which a great difference with respect to the rapidity of their course and the nature of the country
through which they flow, is observed. Accordingly geographers divide the whole of the course of such rivers into three divisions, the upper, middle, and lower course.

The upper course of such a river lies within a mountain-region, and its source is consequently at a great elevation above the sea. The waters run with greater or less velocity, according to the greater or less extent of the mountain-region, and the greater or less rapidity with which the whole region declines towards the country to which the course of the river is directed. When the elevation of the mountain-region is great, and the distance from the source to the valley where the current of the river is extremely rapid, and presents a quick succession of cataracts and rapids. The force of the current is so great that pieces of rock of considerable size, which are frequently detached from the overhanging masses, cannot resist it, and are carried down by the current, until they reach a point where the rapidity of the descent begins to diminish. The region which encloses the banks of the river often rise several thousand feet above it, and their bases are united by slopes forming an angle, over which the water runs on bare rocks, without the least covering of earth. Thus the river does not flow in a valley, but in a cleft or ravine, which cuts deep into the mountain-masses. Sometimes there is space enough for the river to flow wide, and between these wide spaces, many places this space is only obtained by artificial means, as by cutting away a projecting portion of the the rock, or by making a tunnel through it. Where either of these means cannot be applied, the path is continued over the bed of the river by a wooden bridge of greater or less extent, until a place is reached which offers sufficient space for the river to flow between the rocks. The course of the river is generally in a straight line, but sometimes it makes short and abrupt bends which form acute angles. In the last-mentioned case it is, almost without exception, observed, that the mountains which enclose the river have on one side a projection, and on the other a receding, which correspond so exactly to it if it were possible to unite both mountain-masses, and the projecting would exactly fit into the receding part. This peculiarity in the formation of the ravines of mountain-streams was observed by the Spaniards in the Andes of South America, who called them quebradas, or broken; by this term tacitly assuming that the phenomenon had been caused by a violent disruption of the mountains. This description of mountain-ravines and their development, which applies particularly to those of the western Alps along their southern declivity, to those rivers which constitute the upper branches of the rivers Doria and Sesia, to the valleys of Anzasca and Vedro on the southern side of the great road of the Simplon, and to the still larger valley of Aosta, through which the road leads from Switzerland to Italy over the mountain-pass of the St. Bernard. The military road of the Romans was made through the Val d'Aosta; but in these parts it was only practicable for beasts of burden. Such deep ravines not only occur between the gigantic elevations of a high range, but likewise in the elevated table-lands. Humboldt observes that the Plain of Quito, which is nearly ten thousand feet above the sea, is intersected by ravines, which in some places are so deep that their bottoms are hardly more than two thousand feet above the sea-level; and he adds that some of them are so narrow as not to contain the smallest cultivable space. Similar ravines intersect the table-lands of Guatemala and Anahuac, where they are called cañadas.

A mountain-region through which the upper course of a river lies descends with less rapidity, and consequently occupies a much greater extent of country, the mountain-streams, as well as their banks, present very different features. Both the streams and the banks show that the descent of the whole mass is not by a regular slope, but is formed by an alternation of plains and declivities; in ascending such a mountain-stream, it is found that in certain places the mountain-masses approach so near to the banks, as to leave hardly room enough for the river, and in these narrow the current is extremely swift, and generally a continual rapid, interrupted by falls of moderate height. These narrows, however, rarely extend more than a few miles. Above them the mountains recede more, the sides of the valley become wider, and between low banks of earth. The bottom of the basin is level, or descends with a gentle slope, and may be cultivated or used as pasture-ground. In some of the rivers which descend from the central and eastern Alps this alternation of narrow passes and basins occurs several times. Thus the Reuss, along which the great road runs which leads over the mountain-pass of St. Gothard, rushes with incredible velocity through the ravine of the Hospental, and falls one thousand eight hundred feet before it reaches the basin of the valley of Ursern, which is nearly eight miles long and more than half a mile wide. At the northern extremity of the valley of Ursern the river enters the second narrow at the Urnerloch. This narrow, which extends about three miles to Geshinen, is extremely contracted, and within these limits the river descends one thousand and seventy-four feet, forming a succession of small cataracts. Below this is the basin of the side valley of the Ticino. It is not the Ticino that of Ursern, and about six miles long. The course of the river within this basin is rapid, but there are no cataracts. From this valley the river escapes by the third narrow, which is about four miles long, and also very contracted: it terminates at the village of Am-Säflis, where the Reuss enters the valley of Uri, in which it flows until it reaches its waters with those of the lake of Uri (Urner-sec), as the southern part of the Vierwaldstätter-see is named. The same conformation is observed in the southern declivity of the Alps, where the river Ticino descends from the mountain-pass of St. Gothard. This river runs in a ravine from the Hospental to Airolo, in which it descends about two thousand and eighty feet. It then enters the upper valley of Loveventina, which is about seven miles long and half a mile wide, and in which the river is rapid, but has no cataracts. It issues from this valley by a narrow about two miles long, between Il Dazio and Faido, where a series of beautiful waterfalls occur, and the ravine is so narrow that an artificial road has been cut on the adjacent mountain called the Platter. At Faido the Ticino enters the middle valley of Leventina, in which it flows with great rapidity to Giornico, a distance of about fifteen miles, but without forming any falls. The valley is less than half a mile wide, and often interrupted by rocks. Above Giornico the river enters a short narrow, at the outlet from which it forms cataracts, and then reaches the wide valley called the Lower Valley of Leventina, in which it flows with a comparatively gentle course to Lago Maggiore. The greater number of the rivers which originate in the Alps and Pyrenees are of this latter description. The basins which occur in these river-valleys may at some remote period have been filled with water, and this water have been drained by the rivers forming an outlet for the waters by the narrows which now connect their basins with one another.
RAILWAY RAMBLES.

CASSIOBURY.

Once more we find ourselves among the throng of persons who are fast settling themselves into the different carriages of the train about to start on the Birmingham Railway; many, no doubt, hastening like ourselves to enjoy the breezes of the country, which, sweeping occasionally across the metropolis, invite us so wooningly forth. Carriage after carriage is filled, and still more are in requisition; and one cannot but admire the ingenuity of the contrivance by which, in the midst of so much bustle, the carriages, as they are wanted, are brought along a short rail extending from the principal rail at right angles, till they are in the middle of the latter, when there is a pause, and, lo! the whole floor with its rails turns round, and the carriage is in due position ready to attach behind us. A gayly row of carriages now formed, we are starting, and after a short run with the assistance of the engine and rope, the locomotive is attached. Gently at first does it move; putting forth its mighty powers as with a consciousness of the necessity of gentleness in their exercise; but the pace rapidly increases, and we are presently flying along, sometimes in a straight line, and dull must be the soul that in ordinary circumstances can feel none of the exhilarating influences of the speed, and of the consciousness that all the means by which it is produced are the product not merely of the skill and enterprise of our own age, but of our own day; that the very men who have been the chief artists of these great works are yet moving among us, and still busy in their vocation.

Cassiobury, or Cashiobury, for the word is spelt both ways, is our present destination, so we stop at the Watford Station, and ascend to the bridge which here crosses the railway, and pursue our route along a delightful road, which, but for its breadth, might be called a green lane, so embosomed is it in trees, and luxuriant the foliage, flowers, and fruit of its hedges. A curious effect of the establishment of the railway station here is noticeable as we stand a moment on the bridge we have just mentioned; we count six houses in all, scattered about, and of these five are public-houses newly erected. After a walk of about a mile, the lodge appears directly facing us, stretching across a corner in the road. It is an interesting and antique-looking edifice, with mullioned windows, half overgrown with ivy, and terminating on one side in a little steeple like that of some very rustic church, and on the other with a square battlemented tower pierced by narrow slit-holes. Roses are clustering over the latter, and it is pleasant to reflect that the times have passed away when there might be any danger of disturbing them. The noble park now opens upon us as we step through the lodge gates, clump upon clump, wood upon wood stretching far away into the distance, where the eye rests upon gleaming waters. Instead of following the carriage road, which pursues a somewhat circuitous course to the mansion, we take the footpath to the right; and scarcely have we ceased to admire some of the many noble trees which we meet at every step, or the masses of graceful fern, that most beautiful of vegetable forms, before a glimpse of turret towers is caught through the trees, then lost again, and then again seen still more plainly. The path now winds round a thick shurbbery close to the mansion, which shuts the whole out from our view; and that past, the entire building is before us, in all the splendour of Gothic architecture; here used in the adornment of a building presenting the mixed ecclesiastical and castellated styles. The adoption of the former in the wing nearest to us, giving to the whole the exact appearance of a beautiful chapel, is hardly fair, or perhaps even, closely considered, in good taste; for this simpleness of the edifice is not wanting, about the year 1800, when Mr. Wyatt, under the direction of the late earl, rebuilt Cassiobury; but we repeat there is none now, and after admiring the part of the exterior in question, and investing it with all the associations natural to its appearance, one feels inclined to resent its very existence, on finding there is nothing within of what we had a right to expect. It may perhaps mollify the antiquarian who had visions of rich brasses, and quaint but most provokingly half-illegible inscriptions, to point out in the porch beneath the beautiful window of this apparent chapel, an oaken door literally covered with rich carving, including a row of portraits, from the cathedral of Beauvais in France.

The entrance vestibule is airy, light, and beautiful, yet at the same time not without an antique expression; for the range of windows extending upwards almost from the floor directly opposite, and opening into a little court or formal garden, are richly stained, and above wind to and fro the beautiful lines, with little knots or bosses, of the groined roof. From a notice affixed to the wall, we perceive how far ex-
tends the liberality of the owner of Cassiobury. It appears that there are two days (Mondays and Thursdays) on which the public have free admittance to view the house, the gardens, the park, and the Swiss cottage; and, further, that by obtaining an order from the earl or from the housekeeper, the latter readily obtainable on application at the time, permission is given to go into the dining-room, and commence our examination of the chief treasures of Cassiobury—its pictures. Among the contents of this room is a portrait of the Earl of Northumberland, by Vandyke. It was copied in 1806 by Mr. Phillips, and at the same time cleaned, when a curious evidence of originality was discovered: the truncheon, now in the earl's right hand, was found to have been originally in his left. To another department of art, in which Cassiobury is pre-eminent, wealthy, fine carvings by the finest of carvers, Gibbons, this room also introduces us. The pictures are mostly set in a frame-work of this beautiful nature, where all kinds of still-life are represented with a variety of effect and delicacy of execution truly marvellous. One of the most interesting of the pictures in the dining-room is that representing the widow and two children of the Lord Capel who was beheaded by parliament. As this nobleman is a direct ancestor of the present family, and him from whom they derive their elevation of the nobility from the hand of the man in whose service he served, Charles I.

His royal master preceded him to the scaffold, and the event, while it made more certain his own doom, prepared him the better to endure it. In February following, he, with the Duke of Hamilton, Lord Goring, and Sir John Owen, were tried by the High Court of Justice sitting in Westminster Hall. Lord Capel pleaded that he was a prisoner of war only to Lord General Fairfax, and had had conditions, including his life, promised him at Colchester; but he seems to have been unable to convince his judges of any such promises, and was, with the others, condemned to death. Before execution, two of the number, Lord Goring and Sir John Owen, were respited, and saved, and another, Lord Holland, added to the fatal list; and the three, Hamilton, Capel, and Holland, were beheaded on the 9th of March on a scaffold erected in Palace Yard. Capel seems to have been the only one who had much of the popular sympathy. His resolute behaviour led to the circulation of the following couplet, in connection with his armorial bearings:

"Here lion-like Capel undaunted stood,
Beset with crosses, in a field of blood."


(To be continued.)
ON THE WEAR OF GOLD AND SILVER COINAGE.

That we do not feel the full importance of annoyances until they fall upon ourselves, is a truism which need hardly be insisted on, but which is nevertheless often forgotten. The recent discussions and delays respecting "light sovereigns" have directed the attention of many persons for the last few years. It naturally occurs, where coin must necessarily become somewhat lighter in weight as it is more extensively used, even without the contingency of malpractices on the part of dishonest persons. Respecting the nature and extent of this diminution, and the experiments made on the subject some years ago, a few words may not be misplaced.

We are not aware that any distinct experiments were made to determine the diminution in the average weight of the silver coins at that time. According to these experiments it appeared that

12 $ Crowns, or 27 ½ Half-crowns, or 76 ½ Shillings, or 194 Sixpences, were requisite to make up a pound, troy, instead of

12 ¾ Crowns, 21 ½ Half-crowns, 62 Shillings, 124 Sixpences.

These coins were allowed to run the average career of the silver coinage for the next eleven years, and were then, in 1798, again examined. It was found that the weights had been still further diminished, particularly in the smaller coins, insomuch that

12 ¾ Crowns, or 27 ½ Half-crowns, or 62 ½ Shillings, or 200 Sixpences, were required to make up a pound, troy, instead of the numbers given above.

It was thus shown that in eleven years the coins had suffered, in round numbers, the following loss—

crowns 14 per cent., half-crowns 2 per cent., shillings 5 per cent., and sixpences 3 per cent.; while the whole diminution, from the time of coinage, amounted to—
crowns 3 per cent., half-crowns 10 per cent., shillings 24 per cent., and sixpences 38 per cent.

It must not be understood that the above forms anything like a general average of the effects produced by the abrasion of coins, and the glaring deficiency was the circumstance which called attention to the matter. Still the elements of destruction are always at work, and the government were desirous of obtaining the aid of the Royal Society in determining the cause and the extent of loss by abrasion, not so much in the silver as in the gold coinage, whose superior value made the subject one of increased importance. A committee of the Privy Council was appointed in 1798, "to take into consideration the state of the coins of this kingdom, having among other circumstances remarked the considerable loss which the gold coin appeared to have sustained by wear within certain periods, and being desirous to ascertain whether that loss has been occasioned by any defect in the quality of the standard gold, or in the figure or impression of the coins." The committee requested Mr. Hatchett and Mr. Cavendish, on the part of the Royal Society, to institute a series of experiments on these matters; and those two gentlemen were engaged from the latter end of the year 1798 to April, 1801, in conducting investigations at the Mint.

The report occupies a hundred and fifty pages of the "Philosophical Transactions" for 1803, but we can here, of course, only briefly mention the conclusions arrived at. The questions submitted for investigation were principally these:—

1st, "Whether very soft and ductile gold, or gold made as hard as is compatible with the process of coining, suffers the most by wear, under the various circumstances of friction to which coin is subjected in the course of circulation?"

2nd, "Whether coin with a flat, smooth, and broad surface, wears less than coin which has certain protuberant parts raised above the ground or general level of the pieces?"

To answer these questions, Mr. Hatchett and Mr. Cavendish deemed it desirable to determine the effect which various alloys produced on the qualities of fine gold; how far the specific gravity is effected by the alloys, and to what extent the nature of the alloy and the form of the piece influenced the abrasion by friction.

Gold was alloyed respectively with arsenic, antimony, zinc, cobalt, nickel, manganese, bismuth, lead, tin, platinum, copper, and silver, with a view to determine which alloy gave to the gold those qualities best fitted for the purposes of coin. Arsenic, and many of the other alloys, evaporated to some extent during the art of composition; while others of the alloys produced a compound metal too brittle or too soft for coin, or else badly coloured. The experimenters concluded that "the whole of the experimenttend to prove, that (agreeably to general practice and opinion) only two of the metals are proper for the alloy of gold coin, namely silver and copper, as all the others either considerably alter the colour or diminish the ductility of gold." The worst metals for the alloy were found to be bismuth, lead, and antimony.

The next experiments were on the specific gravity of the alloyed gold, and the causes which led to changes in its amount. This was an elaborate investigation, and ended in results which are in a scientific point of view very valuable; such as the effect of sand-moulds and iron-moulds in casting ingots; the unequal mixture of the heavy gold and the lighter alloy in the melting-mould and number of particular importance to the operations of the Mint.

The last series of experiments related to the effects of friction in wearing away gold coins, and were intended to decide the question as to which alloy renders gold most durable. Twenty-eight pieces of gold were fixed in a frame, over which were placed another twenty-nine similar pieces; and the upper pieces were made to rub to and fro in the lower ones, with a pressure of a certain amount. The pieces were alloyed differently, and the object was to determine which alloy withstood best a given amount of friction. Standard gold pieces, and afterwards pieces containing one-half of copper, were in determining the causes and amount of the destruction are always at work, and the government were desirous of obtaining the aid of the Royal Society in determining the cause and the extent of loss by abrasion, not so much in the silver as in the gold coinage, whose superior value made the subject one of increased importance. A committee of the Privy Council was appointed in 1798, "to take into consideration the state of the coins of this kingdom, having among other circumstances remarked the considerable loss which the gold coin appeared to have sustained by wear within certain periods, and being desirous to ascertain whether that loss has been occasioned by any defect in the quality of the standard gold, or in the figure or impression of the coins." The committee requested Mr. Hatchett and Mr. Cavendish, on the part of the Royal Society, to institute a series of experiments on these matters; and those two gentlemen were engaged from the latter end of the year 1798 to April, 1801, in conducting investigations at the Mint.

The report occupies a hundred and fifty pages of the "Philosophical Transactions" for 1803, but we can here, of course, only briefly mention the conclusions arrived at. The questions submitted for investigation were principally these:—

1st, "Whether very soft and ductile gold, or gold made as hard as is compatible with the process of coining, suffers the most by wear, under the various circumstances of friction to which coin is subjected in the course of circulation?"

2nd, "Whether coin with a flat, smooth, and broad surface, wears less than coin which has certain protuberant parts raised above the ground or general level of the pieces?"

To answer these questions, Mr. Hatchett and Mr. Cavendish deemed it desirable to determine the effect which various alloys produced on the qualities of fine gold; how far the specific gravity is effected by the alloys, and to what extent the nature of the alloy and the form of the piece influenced the abrasion by friction.

Gold was alloyed respectively with arsenic, antimony, zinc, cobalt, nickel, manganese, bismuth, lead, tin, platinum, copper, and silver, with a view to determine which alloy gave to the gold those qualities best fitted for the purposes of coin. Arsenic, and many of the other alloys, evaporated to some extent during the art of composition; while others of the alloys produced a compound metal too brittle or too soft for coin, or else badly coloured. The experimenters concluded that "the whole of the experiments tend to prove, that (agreeably to general practice and opinion) only two of the metals are proper for the alloy of gold coin, namely silver and copper, as all the others either considerably alter the colour or diminish the ductility of gold." The worst metals for the alloy were found to be bismuth, lead, and antimony.

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The questions submitted for investigation were principally these:—1st, "Whether very soft and ductile gold, or gold made as hard as is compatible
The entire results of the experiments made by Hatchett and Cavendish led to the conclusion that the standard adopted in the English mint is, on the whole, one fourth the number that could have been used on that principle, the diminution in weight, by long-continued friction, is very inconsiderable.

In 1807 the officers of the Mint made an investigation, not into the respective qualities of different alloys for coin, but into the actual loss which the current coin had suffered in a given time. One thousand guineas were picked from a banker's and weighed. 636 were found of full weight, and 314 light; the deficiency on the whole was about 17s. 5d. per cent. Of 100 guineas collected at a retail shop, about half were under weight, and the deficiency on the whole was about 22s. per cent. Of 600 half-guinea pieces, collected at a banker's, more than three-fourths were under weight, and the average loss was nearly two guineas per cent. Of 300 seven-shilling pieces (a coin used at that time to a limited extent) the loss was only about 17s. per cent. Mr. Jacob, from considerations which he explains in his 'History of the Precious Metals,' assumed that the gold coins thus experimented on had on an average been in circulation from hand to hand in the usual manner, for a period of about ten years; and, from further considering the proportion which the half-guinea bore to the guinea, and the relative wear of each, he states his belief that the average annual loss of the coins by abrasion consequent on the usual commercial dealings, was about 18th part of the whole. Mr. Hatchett and Cavendish led to the conclusion that the silver coinage was on the whole under weight, and the deficiency on the whole was about 3s. 9d. per cent. of the weight; and that if we similarly circulate 150 silver coins, such as shillings, their weight will be reduced to about 8s. 9d.; and that if we similarly circulate 150 silver coins, such as shillings, their weight will be reduced to about 1s. 4d.

The difficulty of forming a judgment in this matter is extremely great; and Mr. Jacob gives his results as only such approximations as he could venture to offer. We are not aware whether any investigations are now being carried on by the officers of the Mint on this subject; but the present time seems to be peculiarly fitted for such an inquiry.

The Orchidaceae.—One class of plants, which, though it has lately become most fashionable, and cultivated by an almost separate clique of nurserymen and amateurs, cannot yet be said to rank with florists' flowers, is that of the Orchidaceae, though so well known, when first introduced, by the name of air-plants. It is scarcely more than ten years ago that any particular attention was paid to the restoration upon this interesting tribe, and there are now more genera cultivated than there were then species known. Among all the curiosities of botany there is nothing more singular—we had almost said mysterious—than the character, or, to speak more technically, the 'habit' of this extraordinary tribe. The senecio (from which the first exhibition of the plant, Oncidium papilo) produced at the Chiswick Gardens must still be remembered by many of our readers, and so wonderful is the resemblance of the vegetable to the insect specimen, floating upon its gossamer-stalk, that even now we can hardly fancy it otherwise than a living creature, were it not even more like some exquisite production of fanciful art. Their manner of growth, distinct from, though so apparently like, our native milkleto, and other parasitical plants—generally reversing the common order of nature, and throwing summersets with their heels upward and head downward—one specimen actually sending its roots into the air, and burying its flowers in the soil,—living almost entirely on atmospheric moisture,—the blossoms in some species sustained by so slender a thread that they seem to float unsupported in the air—all these things, combined with the most exquisite contrast of the rarest and most delicate colours in their flowers, are not more extraordinary characteristics of their tribe than is the circumstance that in nearly every variety there exists a remarkable resemblance to some work either of animate nature or of art. Common observation of this genus in our own woods and fields has marked this in the names given to the fly, the bee, and the spider-orchis; but in the exotic orchidaceae this mimicry is still more strongly marked. Besides the butterfly-plant already alluded to, there is the dove-plume, and a host besides, so like to live things than flowers, that they seem to have undergone a metamorphosis under the magic wand of some transforming power.—Quart. Rev.
Supplement.] The Penny Magazine.

A Day At A Floor-Cloth Factory.

What would our ancestors have thought, if they could have seen the varied and glittering devices which now deck the floors of our apartments? In the times when tapestried hangings decorated the walls, the floors were either left bare or were covered with green rushes renewed from time to time as occasion required. Our old annalists and county topographers make repeated allusions to the preparations of the 'Great Hall'—a component part of most old mansions—on the occurrence of festivities, by the spreading of clean new rushes on the floor. At what period this custom was discontinued it would perhaps be difficult to say. The great beauty of the joinery-work in the floors of the majority of old mansions seems to point to the fact that they were intended to be left bare; and the polished boards, frequently arranged in a skilfully-contrived mosaic pattern, still remain to attest the care taken in their preservation. The first woven fabric used as a floor-covering in England was probably some coarse kind of drugget, for it seems at least consistent to suppose that the costly carpets imported from Turkey were not introduced until rough attempts had been made to produce a home-manufactured fabric. But be this as it may, the general use of carpets in England extended itself very slowly. It is stated in the 'Penny Cyclopædia,' that 'The consumption of carpets in Great Britain up to about the middle of the last century was so trifling, that, as a manufacture, it was hardly deserving of notice; and although now so essential to our warmth and comfort, a few generations since carpets were only partially used in the mansions of the rich. Only a few manufactories of which that at Wilton was the most important, existed in different parts of the kingdom; and at Kidderminster, which is now the principal seat of the trade, and where at least five thousand persons are employed in its different branches, the carpet manufacture did not commence before the early part of the eighteenth century. We doubt whether at the commencement of the nineteenth century one-fourth of the present number of carpets was manufactured.'

Still more recent was the introduction of that kind of floor-covering which is made of painted canvas, and which is generally termed oil-cloth or floor-cloth,—though painted-cloth would perhaps be a better name. The steps whereby we may suppose this material to have been gradually brought to the state usually presented by it at the present day are simple and obvious. In the first place a coarse hampen or flaxen fabric was woven and laid down as a floor-
covering. It was then probably suggested that the durability of the material would be greatly increased by laying on a coating of paint, or by saturating the fibres of the cloth with oil or paint, allowed to become thoroughly dried and hardened before the cloth was brought into use. The painter would then exercise his taste in producing a pattern on the cloth, by using paint of different colours, and with; it is all in his broad reference to some particular device. Then would ensue the use of stencil-plates, as a means of producing an unlimited number of copies of the same pattern, so as to expedite and facilitate the painting of the device. The stencil-plates were probably made of thin sheet-metal with the pattern cut or stamped out of them; a pattern could be produced by painting the canvas—previously prepared with a ground-colour—over the parts left bare by the stencil-plates; the pattern, too, would be more or less elaborate according as there were or were not different colours, one stencil-plate devoted to each colour. Lastly ensured that improvement which arises from printing the device on blocks, the cut or pattern of the blocks—previously formed with a ground-colour—being brought prominently in the background, much more may have probably seen a high square building standing prominently near to it, we see that the building itself is one of the most difficult and elaborate patterns ever produced by men, cutting a large finished piece of cloth to the required size; or by others opening a bale of canvas, and spreading it out on the floor preparatory to placing it on a roller; or by others hauling up a roll of canvas to the painting-room;—one or more of these operations being carried on at a time according to circumstances.

At the southern end of the drying-room a few descending steps lead us to the 'colour-room,' wherein all the colours used for painting the cloth are prepared. In the centre of this room is a large horizontal cog-wheel, moved by horse-power; and around it are various machines set in motion by cog-wheels drawing in the liquid colours which are employed in the grinding and preparation of the colours.

Behind the 'colour-room' is an open court or yard, in which are three large lined-oil cisterns, capable collectively of holding forty tons of oil. From these proceed the requisite pipes for causing the flow of the oil into the proper vessels in the colour-room. In the rear of the premises, and near the southern side of the yard, are a carpenter's shop and a smith's shop, for the manufacture of the printing-blocks, and the repair and adjustment of various parts of the working apparatus.

Returning again to the large drying-room, and ascending a few steps, we come to a range of store-rooms over the drying-room, which is used as a colour-room, where the canvas, brought from Scotland in bales, and afterwards rolled up into coils, is deposited till required for use; these coils, about five or six feet high, are ranged vertically on all sides of the room. Another is the 'print-room,' or store-room, where are kept the greater part of the carved blocks used in producing the patterns on floor-cloth. In fact, it will be easily conceived, if we come to describe the process, are necessarily very numerous; in fact, they amount to some thousands, and all are preserved with great care, since the fracture of any of the small projecting points would at once spoil the pattern. The room in which they are kept maintains a pretty constant temperature throughout the year; and the wood in which the blocks are cut is such that the wear which might result from change of temperature and moisture. In this range, too, is a colour-store-room, and others which require no particular notice.

A further ascent of a few stairs brings us to the 'frame-room,' a part of the premises so closely filled, that it is difficult for a stranger to see what is going forward. He can observe, however, that the room, which is long, wide and high, is occupied
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by a series of vertical frames, with canvas stretched over them, and a sufficient interval between them to allow a man to pass. Let the reader conceive a stretched canvas, about sixty feet long and twenty-four high, enclosed in a frame similar to a schoolboy's slate and twenty or thirty of these lying parallel, with a slender scaffolding built up in each of the intervals between them; he will then have an idea of the appearance of the 'frame-room.' The greater part of these frames are about the size here mentioned; but there are others extending as much as ninety-eight feet in length, although the height is somewhat less. Nearly on a level with this room is a floor or platform by which access is gained to the long pieces of passage-floor-cloth, suspended, like the others, from near the roof of the building.

The next stage or story of the factory is the 'printing-room,' where the floor-cloth receives the pattern by which it is distinguished. Here we see a number of banks of printing machinery—something like the inkings-cushions used in hand-printing—covered with bright colours, and men transferring the colours therefrom by means of blocks to the painted canvas, the latter being stretched out on a long flat bench. Another room above this is similarly occupied by men 'printing' the narrow floor-cloths for passages.

One of the most interesting features of the building, at a considerable distance from the printing-room, is a small square room, provided with windows on all four sides. From this an extensive view may be obtained in every direction, since the position of the observer is considerably higher than any other building in the neighbourhood, except church towers. As this room is, however, rather an apartment than a portion of the factory, we shall not further describe it.

The tour of inspection we have just taken will have probably informed the reader that the routine of processes carried on in the manufacture is somewhat as follows:—opening the bales of canvas, coiling the canvas on rollers, hauling the rollers up to the frame-room, stretching the canvas on the frames, painting the canvas while in this position, removing the painted canvas to the 'printing-room,' painting or printing the device on it, and finally suspending it in the drying-room till ready to be employed as floor-covering. To these successive steps, then, we shall direct our attention.

If we look at the edge of a piece of floor-cloth which has been rent or worn into holes, we shall see that its foundation is a woven fabric of a coarse but stout character, woven expressly for that purpose. This fabric is coated so completely on both sides with paint, and brought to such an excellent surface, that it can stand the wear and tear of any ordinary floor-cloth. Sometimes, when an old carpet of good quality has lost its beauty, the design is transferred to it in the same manner as we have described. The roller, which is made of stout oak beams, two horizontal, to form the top and bottom, and two vertical, to form the sides or ends. The roller being about the same height as the frame, and a small portion of the canvas being unrolled, it is easy to nail the edge of the canvas to one of the upright posts, thus forming the first part of the stretching of the canvas. The frame-room is then wheeled on, the canvas being unrolled as it proceeds, parallel with the frame. As it unrolls the canvas is fastened temporarily to the top beam by means of a simple but ingenious contrivance called a 'quickset,'—a much more intelligible name than is often applied to working tools. This quickset is a kind of a screw and nut, and is bolted to the top, and a small pointed hook at the bottom: the large hook catches hold of a rod lying on the top of the frame,
while the small lower hook catches in the canvas: there is a nut by which the screw is carried up tightly to the upper beam of the frame, so as to keep the canvas nearly at its proper height; while the upper hook, by being able to move along the rod, suffers the quick-set to move to the right or left as the canvas becomes stretched. This is only a temporary contrivance, used while the immense area of canvas is being adjusted to the four sides of the frame; but it is one of those ingenious adaptations which could only result from a steady observance of the object in view.

When the low-wheeled carriage, in which the roller rests, has travelled from end to end of the frame, and the canvas has become wholly unrolled, and the upper edge temporarily held up by a number of 'quicksets,' the roller is wholly removed, and the upper upright beam of the frame is nailed to the other upright beam of the frame. It will readily be understood that, if this beam were a fixture, it would be next to impossible to nail the canvas to it with sufficient tightness and stretch in every part. The beam is loose, and the edge of the canvas is nailed to it while the threads are not yet so set as to require being brought into use, one attached to the upper end and the other to the lower end of the beam; and each screw being worked, the post is drawn forward until the canvas is fully stretched; after which the beam is fixed, and the canvas remains stretched. When it is considered that each of these pieces of canvas contain upwards of six hundred square feet, and that it is drawn out nearly as tight as a drum before operations are commenced upon it, it will be readily supposed that a powerful force is required to effect the requisite strain.

When the two vertical edges are properly secured, the upper and lower horizontal edges are fastened. The upper edge is nailed, at distances of between two and three inches; and the 'quicksets' are removed when their aid is no longer required. The fastening of the lower horizontal edge requires a force analogous in kind (though not so great in amount) as that applied to the vertical edge. The edge is nailed to the lower beam, and the beam is forced down by means of levers, chains, and hooks, other means, it is put into a vessel called a 'run' or remaining brick-shaped pieces about six inches in length by two inches in thickness. The workmen rub to and fro with these pieces of pumice over the wet canvas, until the surface is rendered considerably smoother than in its natural state. They mount the highest stage of the scaffold, and rub down the upper portion of the canvas first; then they descend to the next stage, proceeding from end to end of the canvas, and so on to the lower stages.

While the sized canvas is drying, we will visit the colour-room, and briefly consider the nature of the paint applied to the canvas. The painting of floor-cloth is, in principle, analogous to house-painting, though different in some of the practical details. The materials employed are the same as those used in a colour-room.

The painting of floor-cloth is, in principle, analogous to house-painting, though different in some of the practical details. The materials employed are the same as those used in a colour-room; but the principle is just the same.
The paint employed for floor-cloth has these two peculiarities, when compared with that used in house-painting;—it is very much stiffer or thicker, and has scarcely any turpentine in its composition. Both of these characters are given to it to ensure the durability of the cloth; since a large body of paint can be laid on when the consistency is thick, and the paint becomes harder and more durable when the liquid employed is wholly or almost wholly oil,—although a much longer time elapses before the paint becomes thoroughly dried and fit for use.

When the paint is prepared, with a thickness or consistence not much less than that of treacle, it is applied to the cloth in a very curious manner, more analogous to the manipulations of a plasterer than those of a painter. The workman holds in his left hand a stout thick brush, which he dips into the paint-pot, and then dabs or splashes on the canvas; the paint is too thick to be brushed over in the usual way, and is therefore laid on abundantly in a few detached patches. The workman holds in his right hand a kind of trowel, consisting of a long narrow blade, about a foot in length, decreasing in width towards one end, and having at the other a handle which bends back over the blade. With this trowel, as represented in the annexed cut,

the workman draws the paint over the canvas, smoothing it repeatedly, and drawing a supply from the patches or masses of paint which had been thrown on by the brush. The trowel is worked with its plane or face not precisely parallel with the surface of the canvas, but somewhat inclined, so as to rub or scrape the paint into the fibres of the canvas. The scaffolding, being erected somewhat on the principle of that used by builders, has its successive stages so far distant as to allow the arm of the workman to reach over the intervals between them; so that by descending from one stage to another, and working on the portions of canvas intervening between them, the whole piece can be prepared in a similar way. The edge of the plank or platform forming each stage of the scaffolding is about a foot or fifteen inches distant from the canvas, so that the workman is enabled conveniently to reach it.

The process here described relates to the back of the canvas—that surface which is to be underneath or next to the floor when the finished floor-cloth is in use. After this 'trowel-colour' is, however, laid on the back of the canvas, and when it is nearly dry, operations commence on the face, which has hitherto been left untouched. The surface is wetted with a weak solution of size, and rubbed down with flat pieces of pumice-stone, as in the former case, and with the same view of preparing the fibres of the canvas for the reception of the paint. The exception to the paint is on the back of the canvas, but differing from it in two respects: it is much more liquid, on account of the addition of an extra portion of oil, although considerably thicker than common house-paint; and it is laid on wholly with a brush, instead of being worked conjointly with a brush and a trowel. Hence it is called the 'brush-colour,' to distinguish it from the 'trowel-colour.' The tint is of no particular importance; but we believe that each manufacturing firm is accustomed to adopt one particular colour for the back of their floor-cloth, which thus becomes a kind of symbol; besides which, certain private marks are stamped on the back of the cloth; after which that surface is finished. The time has been when a duty was laid on floor-cloth, and when the Excise officer exercised that supervision which is so vexatious and mischievous in manufactures; but this is no longer the case.

The back of the canvas is entirely finished before the face has undergone any process except the sizing and rubbing down with pumice-stone; but now the preparation of this surface is attended to. A 'trowel-colour,' similar in consistence to that used on the back, is applied, and allowed to remain untouched till dry. Then the face is primed a second time, to work down some of the asperities and projections which still remain on the surface. To this succeeds a second trowel-colour, in every respect resembling the first; and after a due interval for drying, the surface is a third time rubbed down with a pumice, after which is given a 'brush-colour:' the object of this careful and long-continued series of operations, which occupies a period of two or three months, is to bring the surface of the canvas to a state of great smoothness and pliability. The repeated rubbing with pumice-stone not only levels irregularities, but imparts to the canvas much of the pliability and durability of leather. We believe that where floor-cloths are made expressly to be sold at a low price, the routine of processes is more expeditious and less complete than that here indicated; but we are describing the operations of an establishment where the better kinds are manufactured, as a means of giving a more close insight into the matter.

We now approach that class of operations which, so far as appearance is concerned, is the most important of any, and the most interesting to a stranger who visits a factory of this kind: we mean the printing, or transfer of a device to the surface of the cloth. It must be borne in mind that the canvas is all this time in a vertical position, stretched over the frame to which it had been fixed two or three months before; and that the colour of the final coating of paint is that which is to form the ground or foundation colour of the pattern. The printing is effected while the canvas is lying horizontally on a long bench or table, and an entire canvas is therefore necessary. The painted canvas is gradually loosened from the nails by which it is fastened to the frame, and is transferred to a roller whose length nearly corresponds with the width of the canvas. The canvas in its original state weighs not much less than two hundred pounds; and the vast
body of paint subsequently applied to it increases the weight very considerably; so that the loosening of the canvas from the frame, the transference to a roller, and the hauling up of the roller with its load to the printing-room up stairs, are arrangements requiring some tact and judgment. When the roller is carried up, it is placed horizontally at a few inches from the floor, in front of a very long work-bench; and two gudgeons or projecting axles at the ends of the roller being placed in sockets, the canvas can be uncovered from the roller by the rotation of the latter, and spread out upon the bench to be printed.

Here it will be desirable to offer a few brief explanations respecting the patterns of floor-cloths and the modes of producing them. We have before alluded to the original principle cut out for the floor-cloth manufacture. This is now in the possession of the firm whose establishment we are describing, an establishment which was the first in England in this line of business. Before the year 1754 Mr. Nathan Smith, the founder of the firm of Messrs. Smith and Baber, was accustomed to manufacture floor-cloth in pieces of two or three yards square, in the only method known at that time. As soon as we cut in some determinate pattern in thin plates of metal or pasteboard; and these plates being laid on the canvas, and paint applied with a brush, the paint could only reach the canvas at those parts which were not covered by the plate: this is the method of 'stencil-painting,' which is occasionally applied to painting the walls of rooms in distemper, and for other purposes. Each small square of floor-cloth had a border given to it all round; and if a large room were to be covered, several such pieces had to be used. To what extent the floor-cloth manufacture was carried on at that time we have no means of knowing; but it must have been very limited indeed.

A necessary result of stencil-painting is, that very little of the surface of the piece of floor-cloth is left uncut. The block being pressed down on an elastic surface covered with ink, or ink being applied by means of soft elastic balls, or by means of cylindrical rollers, the surface only of the device receives a coating of ink, leaving the interstices free; and upon this being transferred to paper, the black lines of the wood-engraving result.

On this principle did Mr. Smith conceive that the paint might be applied to floor-cloth, the paint in this case being a representative of the ink in the former. He cut with his own hands a device on a square block of wood measuring about twelve or fifteen inches each way, a device which is represented in the annexed cut taken from the block itself. The pattern, though bolder, is somewhat more elaborate than the one just illustrated, but still it was one calculated to test the practicability of the plan which had suggested itself to his mind. An impression from this block was exhibited by Professor Brande, in an illustrated lecture on the floor-cloth manufacture at the Royal Institution, about five or six years ago; and the block itself is carefully preserved by the descendants of Mr. Smith, as an historical memento of an important step in the progress of the manufacture.

Mr. Smith, like inventors generally, was very careful of his production, and for a considerable period printed all his floor-cloths with his own hand, allowing none of the workmen to see the block, and adopting singular precautions to damage the cutting of visiting persons. The original manufactory occupied the site of the present building, and remained standing for forty years, when it was burnt down in 1793. The present structure has been standing not quite twenty years.

The method of printing, originally planned, was very much more simple than that now adopted, owing to a circumstance which is important that we should clearly explain. If, instead of printing in one colour, we adopt several, the complexity is greatly increased; for it would be impossible to paint one part of the block with one colour, and one with another, and then transfer the device to the canvas. It is necessary to have as many blocks as there are colours; and the great difficulty consists in adjusting these blocks so as to unite in producing one pattern. The principle is analogous to that of colour-printing, introduced within a few years, wherein, instead of printing with black or blue or any other monochromatic ink, we have several colours combining to produce one pattern. In such a case a series of plates is prepared, either by cutting away those parts which are not to form the pattern, or inserting slips of copper to form the pattern; each plate being made to furnish one particular portion of the device, viz., that of one particular colour. So it is with floor-cloth printing, under a different modification to suit the object in view.

A moment’s consideration will shew that the cutting of the blocks must be a point of great nicety; for if a portion of the device, cut on one block, occurs at the same point as a portion on another block, the two colours will be confounded together, and the device lost. All the blocks are precisely the same size (about fifteen inches square), all are rectangular, and all are applied successively to every part of the floor-cloth, in patches corresponding with the size of the blocks. Each block is cut away at those parts which are left prominent in all the other blocks; so that it will not impart colour to the cloth where the latter would be coloured by any of the remaining blocks. Perhaps we cannot better illustrate this than by taking an actual specimen of floor-cloth, printed in five colours, and showing the device cut upon each of the five blocks, as far as we can do so on a small scale. In our group of:
patterns we have represented colours heraldically, the only way of so doing when black ink only is used; by heraldically we mean the adoption of certain modes of engraving used in printed plates relating to heraldry, such as the following:—white is represented by a white space, black by a black space, yellow by dots, green by oblique parallel lines, red by vertical lines, blue by horizontal lines, &c. One of the six figures represents the finished pattern, built up as it were of five separate portions; and the others show how the blocks are separately fitted to join in producing the design. Of these five, one is yellow, and the dotted portion shows the parts which are left prominent in the block; all the rest being cut away. In another we see, by the arrangement of oblique lines, the pattern intended to be given in a green colour. The red and the blue are in like manner represented by their peculiar lines; and the black portion of the pattern is given in the form which engravers call 'solid.' It will be seen that the device differs greatly in the several blocks; so much so that they could hardly be recognised as uniting to form one pattern, unless that pattern were presented at the same time. In some rare cases as many as ten or twelve colours have been used in one floor-cloth; and this entails—not only the cutting of an equal number of blocks—but a greatly increased amount of care in every part of the operations.

The choice of patterns for floor-cloth is of course, like that of calico-printing, a matter of taste. Each manufacturer exercises his ingenuity, or avails himself of the ingenuity of others, in devising new patterns. Sometimes, when a piece of ancient tessellated pavement is discovered, such as has recently occurred in the City, the mosaic pattern is immediately copied, and introduced, either as a whole or in part, as a pattern for floor-cloth. But from whatever source a pattern is derived, the mode of transferring it to the several blocks is nearly as follows. The pattern is first drawn and painted in a complete and careful manner, on a sheet of stiff paper exactly the size of the blocks, every colour and every portion of the device being given precisely as it is to appear in the finished floor-cloth. Another piece of paper is then taken, and laid under the first, and by means of a pin or pricker one portion of the device is transferred in outline to the lower paper. Thus: suppose we commence with green, the workman follows the outline of the green portion of the device, pricking through both papers with a pin, and thus having a series of pin-holes very close together. The under paper is removed, and another one placed in its stead, which we will suppose is to receive the red portion of the device. The workman transfers the outline of this red portion, by means of pin-holes penetrating through both papers to the lower one; and this is in its turn removed to make way for a third. Thus the operation continues, until as many pricked papers are prepared as there are colours; and it must be obvious from the nature of the method that these outlines are transferred precisely in the way in which they occur in the model pattern. This pattern thus becomes almost one mass of perforation, but it has answered the purpose for which it was intended.

The blocks on which these devices are next to be transferred are made with especial reference to the avoidance of warping or twisting. They are formed of two thicknesses of white deal and one of pear-tree wood, ranged so that the grain of the one shall cross that of the adjoining one, and thus counteract any tendency to distortion. The several layers, after being glued, are kept for some time in a powerful screw-press, as a means of ensuring as close a joint as possible; and when the whole mass, about two inches in thickness, is dried and planed smooth, the pear-tree surface is ready to receive the device. The pricked paper is laid upon the surface, and a little pounce or powdered charcoal, held in a bag which is dabbed on the paper, penetrates the pin-holes, and leaves a series of slight marks on the block sufficiently
distinct to guide the pencil of the carver in working out the pattern. He then proceeds to cut away all the parts which do not form the device, carefully leaving the latter. Occasionally, if the pattern admits of it, small brass pins are inserted to make up the form, and brass pins are also fixed at the corners to guide the printer in joining the several portions which he prints, and in making the coloured portions to fall in their proper places.

When the cutting of the set of blocks for one pattern is completed, the blocks are soaked with oil on their upper surface, to fit them better for the purpose they are to fulfil; and when all is ready, the printing-process commences. The printing-room contains a great number of flat cushions similar to those represented in the annexed cut. Each cushion measures about three feet by two and a half, and consists of a pad of flannel covered with a piece of floor-cloth. There are, for every pattern, as many of these cushions required as there are colours in the pattern about to be printed. A pot of paint, not so thick as that before spoken of, but still having a considerable degree of consistence, is placed beside each cushion, and a man with a brush lays a plentiful coating of paint on each; or at least there are one or more boys and men so engaged as to keep all the cushions supplied with sufficient rapidity.

The printer then takes one of the blocks, which he holds by a kind of leathern loop passing over the left hand, and dabs it down on the wet cushion, whereby a tolerably thick layer of paint is caught up by all the projecting parts of the block. He proceeds to the long bench on which a portion of the prepared canvas is spread out, and stamps the block down upon the cloth, whereby the first germ of the pattern is imparted. He holds in his right hand a very heavy hammer, with which he forces the block down into close contact with the cloth, as a means of ensuring the transfer of the paint. A second impression is then effected with the same block close to the first, care being taken that the two impressions shall form one continuous pattern. The printing thus proceeds until the whole width of the piece corresponding with the length of the bench is printed, as far as one width of this block can do it. Then ensues the application of the second block, used with paint of a different colour; the block being pressed successively over every part of the cloth, as the first had been. In this second printing a twofold accuracy is required; first in respect to the successive applications of the same block across the width of the cloth; and next in reference to the junction of the colour in the proper relation to the colour of the preceding block; both of which are attained by attention to the guide-points fixed in the corners of every block.

When the whole of the blocks have been used in succession, and the entire printing effected across the cloth, and to a length of fifteen inches, the roller on which the cloth is wound is turned a little, by which the printed portion is allowed to fall down behind the bench, and a new portion to occupy the horizontal surface of the bench, after which the printing proceeds as before. There is a long aperture in the floor of the printing-room, through which the cloth is allowed to descend as it is printed, and to hang down freely exposed to the air: new portions are unrolled from time to time, as the printing advances, and the finished portions fall lower and lower.

If we examine a piece of floor-cloth, we shall see that there is nowhere a large smooth patch of paint, except in large plain patterns; but that the paint is laid on in little nodules or spots, technically called 'teeth,' from an eighth to a quarter of an inch square. The object of this plan is to secure a kind of adhesion between the timber of the block and the paint; both of which are attained by attention to the guide-points fixed in the corners of every block.

In printing passage floor-cloths of narrow but determinate breadths, the canvas is cut into strips after being prepared on the frames, and is then printed in the same manner as the other, with the exception that the border is printed by narrow blocks much smaller than the square ones. All the floor-cloths of either kind are allowed to hang suspended in the air in the drying-room until fit for use; when they are lowered, spread out on the floor, and cut or planned according to the purpose to which they are to be applied.

In concluding our brief notice of this interesting branch of manufacture, we may remark that floor-cloth is capable of being prepared in such a way as to form a very durable material for covering the roofs of houses. We have seen some which has been so employed for nearly twenty years, and is still in good condition.
THE KAMTCHADALES.

Kamchatka is a portion of Asia which projects in a peninsular form into the Pacific. It stretches towards Japan, and the sea of Okhotsk washes its western shores, the eastern shores of Siberia, and the north-eastern coast of Chinese Tartary. The Japan Islands are some ten or twelve days' sail to the south, and the western coast of North America about as many more on the east. Kamchatka is about the same size as Great Britain, and lies in nearly the same parallel of latitude, but its climate is very different, owing in a great measure to a chain of lofty snow-crowned mountains which runs from north to south and occupies nearly the whole breadth of the peninsula. The summers are short, and during this season a great quantity of rain falls and thick fogs obscure the atmosphere. The winters are long and dreary, though the cold is less severe than in the adjoining parts of Eastern Siberia. Sudden storms of snow and sleet, called 'poorgas,' come on, which, if they were not almost always foreseen, would be very destructive to the unfortunate traveller; but the natives are remarkable for their perception of meteorological changes, and are usually able to foretell a change of weather twenty-four or even thirty-six hours before it occurs. When a 'poorga' overtakes a party before a place of shelter can be reached, the usual plan is to allow the snow to bury them and their dogs, and as soon as it is over they extricate themselves as well as they can. With one exception the rivers, though very numerous, have but a short course from the mountains to the sea. There are many lakes, and some are of considerable extent. The absence of heat is unfavourable to the cultivation of corn and grain, potatoes, and many other useful vegetables, but the wild pastures are very luxuriant, and abundance of fish and water-fowl in the rivers and lake compensates for the defects of a climate which does but little to assist the labours of agriculture. The argali, a species of sheep about the size of a goat, abounds on the mountains, and when they descend to the valleys in autumn the hunter kills them for his winter stock. Bears, wolves, rein-deer, foxes, sables, a few sea and more river otters, furnish warm and durable clothing, coverings for beds, thongs, ropes, &c. The bark of the birch, alder, and willow are used for tanning them; and the fat of animals serves as a substitute for oil to burn in lamps during the long winter, and is used in frying fish. The number and variety of land-birds is not great, but water-fowl, on the contrary, are found in prodigious numbers, including swans, geese, ducks, teal, and snipe, and they are of very superior flavour. The rivers and lakes swarm with fish, particularly those of the salmon species; and, according to Dobell, dogs, bears, wolves, foxes, sables, and various birds of prey live to a great extent upon fish. In the forests there is a great abundance and variety of wild berries, as the wild currant, raspberries, whortle-berries, cranberries, and a delicate species of strawberry. The country is profusely supplied with food for man, and the manner in which it is obtained determines, as we shall see, the character and condition of the Kamtchadale people.
Kamchatka became known to the Russians in the latter part of the seventeenth century. The aboriginal inhabitants, divided into two or three tribes, were in time subjugated; and now pay a tribute of furs and skins, and bequeathed to the government who are stationed in the peninsula. The principal Russian establishment is the town of St. Peter and St. Paul, in the bay of the same name. The natives have adopted the Russian language and the Russian faith, though the old language is not forgotten, and some of their ancient religious usages are said to be about with their rein-deer. In no case has the contact of a more civilized and a less civilized people been attended with so small a shock to the habits of the latter. The population is so scanty, and the fish and wild fowl so abundant, that the march of civilization has not driven the native population to despair. The chase was their ancient pursuit, and it still affords the chief means of subsistence. The winter dress must always have been composed of furs and skins, and it is so still. The introduction of improved culinary utensils, and tools and implements of various kinds, has quietly assisted in raising the natives to a level with Russian civilization. Nankeens are now commonly used for summer clothing, and that enterprising pedestrian traveller Captain Cochrane, who married a native wife, says that he is a single Kamchadale who does not now wear a shirt. The natives live in small villages on the banks of rivers, while the Russian population is usually found in those on the coast. The whole population of the peninsula did not, however, amount to five thousand in 1822, though the numbers of a nomadic tribe who wander about with their rein-deer is not included in this number. The native population is certainly under three thousand. A few of them possess cattle, but about four thousand dogs and twelve thousand rein-deer constitute their chief wealth in live stock. These dogs, as is well known, perform the same work as horses in England. From June to October they are left to shift for themselves, it being impossible to travel at that season; but in winter they are harnessed to sledges, and travel with great spirit over the frozen surface of the snow, performing their task as beasts of draught in a more satisfactory manner than the rein-deer.

The Kamchadales have a great resemblance to the Chinese and Japanese, and, as Captain Cochrane conjectures, to the red aborigines of North America. He supposes that they descended the river Amur, from Chinese Tartary, and reached the peninsula by the Kurile Islands. The rein-deer Kariakees are the only part of the population who do not live in fixed habitations. Great respect is paid to these pastoral chiefs by the other natives, and they are superior to them in many respects. They bear themselves with more spirit, but they are proud, irascible, and revengeful if offended. They are of small stature, not very well formed; and the appearance of the men is inferior to that of the women. The natives who live in villages are more timid, of a mild disposition, quick and cunning, but honest, and their word may always be depended on. Hospitality is carried to an excess among the chiefs. They pay visits to one another of a month or six weeks, until the means of the host are quite exhausted; when he presents his guests at dinner with a dish made up of meat, fish, &c., all mixed together, and very difficult to prepare; and this 'hodge-podge' is taken as a hint that their presence has become inconvenient; the next day they take their departure, leaving a provender for their horses. So strong are their feelings of hospitality, that offence is taken if it be declined. On one occasion Captain Cochrane deeply wounded the feelings of an old man who, it afterwards appeared, had prepared dinner for him, but had not asked the captain to become his guest, in compliance with an old custom which presumes that a stranger has a right not only to a dinner, but to the house and everything it contains; and in the absence of an invitation Captain Cochrane had gone elsewhere.

Until the population has become greater and the game scarcer, it is useless to expect that the cultivation of the soil should attract much attention. Food may be obtained much more easily by the chase. The rearing of live stock in the marshes and meadows, where the fellops, and probably the rein-deer, are also to be found, is the method of ascending and descending. The scarcity of salt is a great evil, as many fish cannot be dried in the open air so as to keep properly until the next year. If salt were more abundant, as many fish might be cured in some seasons as would last several years. Salt was imported from the Sandwich Islands in 1821, but whether the trade continues or not we are unable to state.

There are two descriptions of dwelling-places to be found in Kamchatka, the 'ballagan' and the 'jourta,' the former a summer and the latter a winter residence. A 'ballagan' is described by Dobell as 'a building of a conical form, composed of poles about fourteen to fifteen feet long, laid up from the edge of a circle about ten or twelve feet in diameter, the tops all meeting at the centre, and then tied with osier twigs or ropes. The outside of the poles is then covered with bark of the pine, birch, &c., and oftentimes coarse grass upon the bark. Other poles are afterwards laid upon the bark, and grass to keep it in its place; and are also fastened with osiers. This kind of hut is generally erected on the centre of a square platform, elevated ten or twelve feet, upon large posts planted deep in the ground. The rein-deer Kariakees make the building and between the posts, where they dry their fish, which their hut serves to cover from the weather, as well as to store and preserve them after they have dried. The door of the hut is always opposite to the water; the fire-place is a bed of earth outside at one corner of the platform. A large piece of timber with no either bowels, is placed against the platform at an angle of forty-five degrees, is the method of ascending and descending.' The jourta is adapted to a district in which large timber is deficient, and Dobell describes it as consist-
ing "generally of a frame of timber put into a square hole four or five feet deep, and within the frame a quantity of stakes are set close together, inclining a little inwards, and the earth thrown against them. The stakes are left round on the outside, but hewed within, and the top is framed over in the same manner, and is arched and supported by stanchions. In the centre of the roof is a square hole that serves the double purpose of a door and a chimney, the inhabitants passing in or out by means of a piece of timber placed against the edge of the hole, with notches cut in diametrically opposite the bottom, so that the stakes are covered without with a quantity of earth, and sodded." The jourtas are warmer than most wooden houses, but the smoke is an excessive annoyance. They are made of various sizes and descriptions, and those which have floors are really decent habitations; but fish, smoke, and vermin are too generally the characteristics of a Kamchatka residence. Occasion one may meet with in which the tables and stools, which are generally of poplar, are secured as white as snow, and the walls hewed smooth and whitened. The jourtas of the Reindeer Kariakées resemble tents, so that in a few minutes they may be struck and packed on sledges in winter, and in summer on the backs of the rein-deer. The Yukon, in his quotidian description of the term "joutas," varies from twenty-five to thirty feet in diameter, of a circular form, and composed of a number of poles, from twenty to thirty feet long, forming segments from the edge of the circle, and meeting at the top in the centre, where they are bound with thongs. On the outside the poles are covered with rein-deer skins, excepting a hole that is left about the centre immediately over the fire, to carry off the smoke. Some of these jourtas are made as warm and comfortable as a house. The doors are to leeward, and the two segments opposite the door belong to the chief. There are beds with curtains of rein-deer skins in each of the other segments or divisions of the hut.

Captain Cochrane's 'General Observations on the Peninsula of Kamchatka' contain some interesting remarks on the means of improving the condition of the native population, which is in a declining state from frequent ravages of the small-pox and other diseases, and yet, when he was there about twenty years ago, there was a deficiency of vaccinating matter. Under the present system of administration the colony is very expensive for the government, and it is highly injurious to the natives; and there are many abuses which with a little vigour might be abolished. Captain Cochrane suggested restrictions on the introduction of spirits, which were sold at most extortionate prices to the simple natives, and when they became intoxicated they would thoughtlessly sell their furs for less than they were worth. Occasionally each one may be expected in this article as much as would have purchased enough flour to support them for a year, or enabled them to buy proper clothing, culinary utensils, nets, twine, tobacco, axes, knives, &c. The 'yasack,' or tribute, paid in skins and furs, though of considerable amount, was collected in an oppressive manner. Another subject of complaint arose from the quantity of wood brought against them; and the traders were called upon to perform. These consisted in forwarding the post, and transporting flour and salt. Padovies, or forced levies of horses or dogs, were issued to officers and favourites, who, furnished with one of these billets and a privilege to trade, plundered the poor natives in the most cruel and intolerable manner. Captain Cochrane proposed that the chiefs and paddlers should in some degree be restricted as to the nature of the goods they supplied, and that instead of hawking about so much tobacco, silks, spirits, tea, sugar, &c., they should be compelled to take more woollens and linens, some flour, with a sufficient quantity of axes, knives, kettles, and other useful articles. Lastly, he suggested that the 'yasack' should be abolished, and that each family should be compelled to take from the government one hundred pounds of flour per month, at the price of a sable or a fox skin; and this would be four times as profitable to the government, and relieve the natives of an injurious direct tax. Instead of sending convicts to the peninsula, he would annually convey live stock with a certain number of the Yakuti of Eastern Siberia, who are said to be skilled in the breeding and rearing cattle. A recent traveller has published an account of Kamchatka, and what changes, if any, have taken place in the administration of its affairs we are unable to state.

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A Glacier in the Himalaya Mountains.—Its lower extremity is a short distance from the village of Arindo, and the natives say that it is slowly but perceptibly advancing. It occupies the entire valley, as far as the eye can reach; and a place that looks more like the extremity of the world does not exist in nature. Vast mountains, alike bare, precipitous, and rugged, appear to form a channel for it; and in the extreme distance their sides are coloured with the red and white tints of iron and gypsum.

The width of the lofty wall of ice, in which it terminates towards Arindo, is about a quarter of a mile; its height is nearly one hundred feet. The only way in which I can account for the quantity of snow and rock upon it, is that it has gathered several plants, from which the earth thrown against the rocks in its course, whose violence and velocity betoken a same nature so truly grand as the denouement of the waters from beneath this glacier. The ice is clear and green as an emerald, the archway lofty, gloomy, and Avernus-like. The stream that emerges from beneath it is in its extreme surface, a white and ready-formed river, whose colour is that of the soil which it has collected in its course, whose violence and velocity betoken a very long descent, and whose force is best explained by saying that it rolls along with its enormous masses of ice, that are whirled against the rocks in its course, with a concussion producing a sound resembling that of distant cannon, and if not permanently intercepted by them, may be seen floating on the Indus, even below the valley of Iskardo.—Vigne's Travels in Kashmir and Tibet.

The Dog of Newfoundland.—A thin, short-haired, black dog, belonging to George Harvey, came off to us to-day. This animal is a breed very different from what we understand by the term 'Newfoundland dog' in England. He had a thin tapering moult, a long thin tail, and rather thin but powerful legs, with a lank body, the hair short and smooth. These are the most abundant dogs of the country, the long-haired curly dogs being comparatively rare. They are by no means handsome, but are generally more intelligent and useful than the others. One caught his own fish. He sat on a projecting rock beneath a fish-flake or stage, where the fish are laid to dry, watching the water, which had a depth of six or eight feet, and the bottom of which was white with fish-bones. On throwing a piece of cod-fish into the water, three or four heavy, clumsy-looking fish, called in Newfoundland 'sculpins,' with great heads and mouths, and many spines about them, and generally about a foot long, would swim in to catch it. These he would 'set' attentively, and the strongest one turns his back upon the fish which has first started down like a fish-hawk, and seldom came up without the fish in his mouth. As he caught them, he carried them regularly to a place a few yards off, where he laid them down; and they told us that in the summer he sometimes makes a pile of fifty or sixty a day at that place. He never attempted to eat them, but seemed to be fishing purely for his own amusement. I watched him for about two hours; and when the fish did not come, I observed he once or twice put his right foot in the water, and paddled it about. This foot he did it to 'toll,' or entice the fish; but whether it was for that specific reason, or merely a motion of impatience, I could not exactly decide.—Jukes' Excursions in and about Newfoundland.
RAILWAY RAMBLES.
CASSIOBURY.—(concluded).

Lord Capel's son, the boy in the picture before which we are pausing, and which has suggested these melancholy recollections, was restored to the family possessions by Charles II. on his own restoration to the kingdom, and also created Viscount Malden and Earl of Essex, the famous general who bore the latter title having died without heirs not long before. His history from that period is not without interest. In 1670 he was appointed ambassador to Christian V., king of Denmark, and the mission was attended by some noticeable circumstances. As he approached Denmark, he was waited on near the coast by the English resident, who acquainted him with an Order of Council, commanding all foreign ambassadors to strike their colours to the king's ships as they passed through the Sound; and explaining that three guns would be fired from Croningberg Castle to give him notice, when, if the act required were not performed, a tier of guns would be planted to sink the vessel. The earl was therefore advised to pass in the night, unless he thought proper to comply; but the latter, thanking his informant, said, "He represented the person of a sovereign prince, and that by the law of nations no king ought to strike to another; that to conceal himself under the cover of the night would betray a pusillanimous spirit—ill suited to the character of an English ambassador;" and then he added in the hearing of all around him, he would appear under sail before the Castle of Croningberg about four o'clock in the afternoon of the next day, but those who dreaded the danger and hazard thereof might land elsewhere. At the appointed day and hour he appeared before the castle; the governor fired a gun, which the earl answered by another; a second was then fired from the castle before the ship, and then a third, which damaged the rigging; but the earl sailed on, and landed without further opposition or injury. The governor immediately represented the matter to Christian, who applauded the Englishman's conduct, and commanded the governor to conduct him with the utmost respect to Copenhagen.

Accordingly the governor and the chief officers of state waited upon the earl at Croningberg, congratulated him on his arrival, and prepared to conduct him to the court; but in answer the earl said his ship had been attacked, and the privileges of an ambassador invaded, and "that it did not become him to proceed any farther until his master was righted, and satisfaction made for the insult which had been offered to him." Commissioners were now directed to inquire into the matter, who condemned the unfortunate governor to ask forgiveness in the open street before the earl's lodgings in Croningberg, which was publicly done, the earl standing in the balcony. The transaction would have redounded all the more to the earl's character, if he had spared the governor some of the humiliating circumstances here described, which certainly could not be necessary for the establishment of his master's honour. On his return, he took an active part in politics, and held, among various other posts, that of the lord-lieutenancy of Ireland, from which he was recalled. Subsequently he joined the patriotic party headed by Lord William Russell, Algernon Sydney, and others, and was in consequence struck out of the list of the privy council. Nor was that all. When the Rye-house plot was discovered, the earl was arrested at Cassiobury, in June, 1683, and thence conducted to the Tower escorted by a party of horse. He left the countess apparently with a cheerful conviction that there was no danger, and when some of his friends pressed him to escape, and pointed out the means, he refused on the ground that his friend Lord William Russell would be thereby endangered. But he is said to have been a man of a melancholy temperament, and the cell to which he was conducted was not calculated to dispel whatever gloomy thoughts his situation might instigate. From that very cell his father Lord Capel had been led to execution by the parliament; and there had perished, by suicide or murder, the Earl of Northumberland, his wife's grandfather, in the time of Elizabeth. He wrote to the countess a touching letter to express his regret at the ruin he had brought on her and her children: but she replied nobly, begging him not to think of them, but to study to...
support his own spirit, and preserve his secret. The issue of this business may be told in the words of Evelyn, whose 'Diary' records as follows: "The astonish-
ing news was brought to us of the Earl of Essex having cut his throat, having been but three days a prisoner in the Tower, and this happening on the very day and instant that Lord Russell was on his trial, and had sentence of death. This accident exceedingly amazed me, my Lord Essex being so well known by me to be a person of such sober and religious deportment, so well at his ease, and so much obliged to the king. It is certain the king and duke were at the Tower, and passed by his window about the same time this morn-
ing, when my lord, asking for a razor, shut himself into a closet, and perpetrated the horrid act. Yet it was wondered by some how it was possible he should do it in the manner he was found, for the wound was so deep and wide, that being cut through the gullet, windpipe, and both the jugulars, it reached to the very vertebræ of the neck, so that the head held to it by a very little skin, as it were. The gaping too of the razor, and cutting his own fingers, was a little strange; but more, that having passed the jugulars, he should have strength to proceed so far, that an executioner could hardly have done more with an axe. There were odd reflections on it. This fatal news, coming to Hick's Hall upon the article of my Lord Russell's trial, was said to have had no little influence on the jury and all the bench, to his prejudice." Frightful as the alterna-
tive must be of murder, if not suicide, one scarce knows how to avoid that conclusion. If the earl had meditated suicide, is it conceivable that after refusing to escape, before he was in the Tower, lest it might prejudice his friend, that he should commit the fatal act on the very day of his friend's greatest danger, and thus by ap-
parently acknowledging his (Lord Essex's) guilt make more probable the guilt of Lord Russell? Turning from these tragical recollections of Cassiobury, we may remark that the earl of whom we have just spoken seems to have been a man of domestic habit and refined tastes, fond of the country, where he almost entirely rebuilt, and planted all its fine groves and pleasant gardens. Before laying out the grounds, he sent his gardener, who bore the appropriate appellation of Rose, to Versailles, to study the formal style there adopted in its perfection.

From the dining-room we pass into an ante-room, where the first picture that arrests the attention is that of another victim of the scaffold, the Duke of Mon-
mouth, Charles II.'s accomplished son, and whose inex-
orable judge was his own uncle, James II. The luxuriant pictures of Lely now begin to meet us in striking profusion, the subjects being principally those he so much loved to paint, and in which he so greatly excelled, female beauty and grace. An interesting feature of the ante-room is the collection of exquis-
itely-painted miniatures, chiefly copies of well-known works by the late Countess of Essex. The ceiling, forming one large oval, is painted by Verrio, so well remembered through Pope's satirical line,

"Where sprawl the saints of Verrio and La Guerre."

The subject is Minerva and the Arts and Sciences. This beautiful little place opens upon one still more beautiful, the Conservatory, which runs along the front of the house on that side, with doors and windows opening into it, not only from the ante-room, but from the whole suite of apartments we are about to pass through, containing the ante-room, drawing-room, and library. Nothing can be more charming than the effect of the conservatory so situated, one side of each room seeming to be a garden of the choicest flowers. In the drawing-room, among a variety of other pic-
tures, are a View of Rotterdam, by Callcot; three Views by Turner, Sheerness, Walton Bridge, and a Sea-shore—this last, in particular, a most extraordinary contrast, in its quiet, sober tints, displaying all the "modesty of nature," to the more recent productions of the artist. In all the rooms busts, bronzes, and an endless variety of objects of vertù are scattered about, in the drawing-room we have, among the articles of this nature, a lock of Napoleon's hair, and a piece of the willow that hung, we can no longer say hangs, over his tomb at St. Helena. A set of cabinets of the richest workmanship, inlaid with brass, steel, tortoise-shell, and ebony, also demand a word of notice. The library, a long and handsome room, is also full of pic-
torial treasures; here are portraits by Lely, Vandyke, Kneller (the two daughters of Hyde, lord Clarendon),

[Interior of Swiss Cottage at Cassiobury.]
and Sir Joshua Reynolds. The same rich kind of frame-work also surrounds many of these works, in which the artist, having taken his fancy as the starting point of his invention and executive skill to the utmost. A little recess here also opens into the conservatory, and sitting in it you look along the whole length of the latter through vistas of beautiful and various foliage, and flowers of every hue. Among the pictures which adorn this little nook is Cooper's picture of William III., wounded (in the shoulder) at the battle of the Boyne, and Lord Coningsby and Prince Eugene of Savoy taking it into their hands with his handkerchief. In a cabinet below the picture is the handkerchief itself, with the stains of the royal blood yet on it, though they have lost their ensanguined dye. Other kingly relics are also here, as a lock of Charles I.'s hair, and a piece of the velvet from his coffin. Turning to the left from the library we enter, you cannot fancy you are less showy halls or thickly piled up on the shelves, among which appears conspicuous an interminable row of parliamentary blue books. Several pictures of the Bedford family, connected with the Capels by marriage, are in the inner library, from the Lord William Russell before mentioned, in his flowing wig, to the present Lord John Russell. One of them represents his most beautiful pictures, a portrait of the late earl's wife, deserves more than this passing mention.

The oak-room, the next of the series, is so called from a handsome oaken screen crossing it at one end. Here are Landseer's well-known picture the Catspaw, Zoffani's Portrait of Garrick as Sir John Brute, one of Mengs's favourite subjects, a mixture of animal and still life, horse representing a boy, dog, and goats in a stable, the Grey Horse by Cuypp, Cattle by Wouvermans, Hogarth's Musical Party, &c. The large portrait of Lord Abergavenny, in an ornamental framework of carving, which, numerous as are the works of the kind, Gibbons has left at Cassiobury, must be mentioned, it is so truly magnificent; but for the color, or in fact the result of that era, compared to the improvements in the art of painting within a century, is as the attic to the portico, the sacristy to the chapel. A little State Bed-Room, the wall of which are lined with the boudoir. How shall we describe her ladyship's boudoir? That little palace, small enough for fairies to inhabit, and lovely enough to have been decorated by fairy hands. White and gold are the prevailing colours of the walls and ceiling, the former partially covered by the genius of art with which a new beauty is given to all the rest. One of Carlo Maratti's sweetest pictures, a Virgin and Child, a Monk's Head by Carlo Dolce, exquisite enamels by Bone, some miniatures by the late countess, a lady in disguise with a cap and feather—these are but a few of its artistic treasures. Richly-bound books scattered about the delicate-looking tables, music, busts, vases, flowers, flowery—these are but a few of its artistic treasures. Richly-bound books scattered about the delicate-looking tables, music, busts, vases, flowers, flowery arrangements, and other flowers which run over the whole so luxuriantly. In the same room is one of Watteau's brilliant little pictures, the subject a party seated on the grass and solacing themselves with music; and Cooper's picture to the first Lord Capel defending the town of Colchester.

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The whole of the grounds here laid out into pleasure-gardens amount to seven acres; and are so divided and arranged, that you are led to an intimate communion of nature with the gardener in each and every one of the gardens. Each garden is a miniaturist, and all are most delicate, but all beautiful. Here we have Lady Essex's, full of the choicest flowers, now one blaze of brilliant colours, and exalting the most exquisite odours, with the little summer-house looking so cool and inviting, and a book yet lying open on the table: then, after
winding about through low green alleys, we descend into the herbaceous dell, beyond which again is the Emperor Dell, so called from a rude series of busts of the twelve Caesars, and the rose-garden. At one point our attention is arrested by the sight of two great round balls of granite, the largest weighing upwards of seven hundredweight. These the inscription informs us were fired by the death of Abd-assad, in the gallery, as well as the Dardanelles, into the Endymion frigate during the passage of Sir John Duckworth’s squadron in 1807; and by one of them no less than fifteen men were killed and wounded. The Chinese garden, where everything is neat and formal, with its pagoda-like ornaments and porcelain vases, and that in which is a fish-pond, having over it a willow grown from a cutting of the famous one at St. Helena, are both interesting spots, and deserve more attention than our space will admit of being given. And now we hasten along across the park a little to the left of those bright waters which we see gliding away from the sunshine, into the recesses of the beautiful woods, and after a few minutes’ walk reach a little rude timber gateway with a quaint little brick dungeon beneath it. This is the entrance to the Swiss Cottage, and the charmingly sequestered dell in which it stands, where the rushing sound of waters alone disturbs the deep solitude. The Swiss Cottage is no toy or plaything, but a genuine building with the peculiar national ornaments and lofty surrounding wooden galleries, and is inhabited by one of the earl’s domestics. In this gallery, as well as in the grounds about, visitors may take refreshments (permission, as before stated, having been obtained), and it would be impossible to find a more delightful place. The privilege of spending a day here is well worth the coming down from London, though the distance be some fifteen or sixteen miles. Attached to this dell is the charmingly sequestered back garden, which has been carefully furnished, so as to give the idea of the domestic hearths of the brave and free mountaineers of the Alps. Scattered about in addition are many curiosities; as Bolivar’s boots, an umbrella made of a single leaf of the talipot-tree, used by the grandees of Ceylon. A drawing hung against the wall represents a night attack on a merchant ship of Liverpool by the natives of one of the islands of New Zealand, who were defeated after a sanguinary conflict, and their chief left dead. On the shelf above the picture is the head of this chief. In the lattice windows are some bits of finely-stained glass, and two or three portraits, among the rest Holbein. With a stroll along the banks of the river, the eye is caught by a little rude arbour, or against the trunk and beneath the wide-spreading branches of some aged tree, to local places again on the quiet beauty of the Panda, we at last, with reluctance, take the path across the park towards the lodge gate, and presently lose sight of all that pertains to Cassiobury.

ON RIVERS, GEOGRAPHICALLY CONSIDERED.

(Continued from page 322.)

In some places the elevated mountain-regions border immediately on low plains. In such cases the rivers cannot be said to have a middle course; for as soon as they reach the plain their character is changed, and the rapid torrent is converted into a gentle stream. Thus the Marathon, after issuing from the Pongo de Manseriche, and entering the great plain, flows slowly through the alluvial level; and the Ganges, after leaving the Himalaya Mountains at Hurdwar, flows with great bends through the immense plains of Hindustan. All the rivers which descend from the southern declivity of the Alps to the plain which the river Po traverses are of the same description. In most cases, however, the mountain-regions are not in immediate contact with the plains, but are separated from them by hilly tracts, and that portion of the course of a river which lies through such a hilly region is called the middle course. The rocky masses rarely approach the bed of the river which has a middle course, but retire to some distance from them, so as to form between the higher grounds a wide valley, which the inundations of the river have covered with a thick layer of alluvial soil. It is remarkable that the highest ground of these valleys occurs, without exception, on the very banks of the rivers, and that the land slopes from them towards the base of the higher grounds. Accordingly the inundations generally cover the lower tracts, which are at some distance from the river, to the depth of several feet, while the banks are still above the surface of the water. The slopes of the higher grounds, which may be considered as the sides of the valley, generally have but few hollows where water collects, and they fix a limit to its inundations, are generally gradual, and covered with vegetation. The current of the river itself is gentle. This change, when compared with that of the mountain-stream, is partly due to the more gentle descent of the hilly region, and partly to the form of its course. The bed of the river rarely lies in a straight line, but continually forms bends, which are not acute angles, as in the case of the mountain-streams, but have only a small curvature, so that the river runs through the valley in a serpentine course. This circumstance renders the course of the river much longer than it would be if it flowed in a straight line, and consequently diminishes the fall and the velocity of its current.

It is observed that rivers form numerous small islands and sand-banks a short distance below the place where they issue from the mountain-region. Thus the Rhine, between Basel and Kehl, opposite Strasburg, and the Amazonas below the Pongo de Manseriche, as far east as the mouth of the Yacura, and the Mississippi between the mouths of the Petervriver and that of the Missouri, form islands and sand-banks. This is easily to be accounted for, by observing that the river, on issuing from the mountains, retains a large quantity of earthy matter in suspension, which subsides when the current decreases in rapidity. This sediment forms islets and sand-banks. The Rhine, above the passing of Sir John Duckworth’s squadron, and the Missouri, at Osbowa, or Orsova, on the boundary-line between Austria and Turkey. On the Rhine they occur only between Mainz and Bonn, where the river is traversed by three ledges, at Bingen, at St. Goar, and near Anderiach respectively. Such ledges are found in nearly all the large rivers of Europe. The elevation of these ledges is sometimes connected with ranges of hills.

Ledges of this description occur in many of the Atlantic rivers of the United States, as the Potomac, the James River, and others; and they mark with precision the passage of the rivers from the undulating or hilly region to the low plains along the coast. There are several courses of these ledges.

The lower course of rivers usually lies through a plain. In general there are no hills which constitute
the outer margin of its course, and consequently there is no bottom or valley through which it runs. The banks are very little raised above the surface of the waters, and the level ground extends to a greater distance. The current is slow, the fall being very small. Thus it was observed by La Condamine, that the Amazonas from the narrow at Obydos to its mouth, a distance of about seven hundred miles, does not fall more than twelve feet, or little more than one-fifth of an inch per mile. It can hardly be conceived that a river with so small a fall could propel its waters, and as the current of the Amazonas is considerable, it can only be accounted for by supposing that the enormous volume of water which the river brings down drives on by its pressure that which is before it until it reaches the sea. The country which is enclosed by the arms of a river is called its delta, from the form of the Greek letter \( \Delta \), which the delta of the Nile, that which was best known to the ancients, greatly resembles: but the term is generally appropriated, as most river deltas have the form of a triangle, and consists of a mass of earthy matter which is now occupied by the delta of a river was once a part of the sea, which was filled up by the débris and earthy matter brought down by the river from the mountainous and hilly country through which its upper and middle course lie. This supposition is strongly supported by the nature of the soil, which evidently consists of matter brought down by rivers, and not of such as the sea leaves behind when, from any cause, it retires. It may be added, that this operation of rivers goes on during the inundations, for after the waters have subsided the surface of a delta is found to be covered with a very thin layer of mud, which soon becomes dry earth. The deltas of rivers which are annually swollen by rains, which is the case between the tropics, are generally much more extensive than those which are formed by rivers whose inundations are only produced by the melting of snow.

There is a river of first-rate magnitude which has no delta, though it seems to possess all those qualities which are supposed to be requisite to the formation of such an alluvial tract: the St. Lawrence in North America reaches the sea by a kind of bay, which extends for upward of three hundred miles, and is floored in from twelve feet, to its narrowest part, and increases in width from three to above one hundred miles. One would suppose that the form of this bay would render it subject to be easily filled up by the earthy matter brought down by a river whose course exceeds eighteen hundred miles; and yet we do not find that an alluvium of any extent has been formed along the banks of this wide estuary, except on the right bank below Quebec. This single instance might throw some doubt on the opinion that deltas are formed by rivers in the way above mentioned, if the peculiar nature of the St. Lawrence did not suggest an explanation of this deviation from the common course of things, which rather confirms than refutes the established principle. The St. Lawrence is the only large river of this kind, which traverses a mountainous country before it leaves the grounds of a mountain, and is there divided into three parts, an upper, middle, and lower course; but the exceptions are far from being rare. This happens that the characteristic features by which the middle course is distinguished occur in the upper course. This takes place when a river originates on an elevated table-land, and traverses a considerable part of it. Thus the Indus, the Suldej, an affluent of the Indus, and the Sampoo, rise on the elevated table-land of Tibet, and drain a portion of it to the river Indus, which resembles the middle course of the Rhine or Danube. But where they leave the plain and enter the mountain-region of the Himalaya, they resemble the mountain-streams of the Alps, except as to the volume of water. When the Indus and the Suldej have descended into the plains of the Punjab, they assume the character of the lower Rhine and lower Danube. The Sampoo, after leaving the mountain-region, traverses a hilly tract of great extent, the valley of Asam, before it enters the alluvial plain of Bengal. There are other rivers, in which the characteristic features of the middle and lower course can be recognised: the number of such is considerable, and some of them are supposed to be requisites to the formation of such an alluvial tract: the St. Lawrence in North America, and the Mississippi, neither of which rises in a mountain-region, but in a hilly tract, in the greater part of their progress present the characteristics of the middle course of the Rhine and Danube, but towards their mouths they traverse a large plain. The number of rivers whose whole course lies through a hilly or undulating country is still greater, as is the case with nearly all the rivers of England and the southern part of Scotland, except the Humber, whose course is partly through a low plain. There are also rivers which in their whole course traverse a mountain-region, but they are all small; such are some of the rivers in North Scotland and in Sweden, and nearly all the rivers of Norway, and those on the west coast of South America.

[to be continued]
FROISSART AND HIS CHRONICLE.

No. VI.

ONE OF THE "DEEDS OF ARMS" OF CHIVALRY.

If ever an institution founded on so unnatural a basis as that of making war, or the art of destroying life, the pre-eminent object of living beings could have been permanent, it must have been that of chivalry; for certainly never was human institution better supported by all conceivable human devices. The deepest, most universal, and most unchanging qualities of our nature were, by a species of the subtlest skill, made subservient to a power which was a practical antithesis to them all. Thus, for the love of God, we were taught to destroy his noblest creatures and to deface his fair world; and in order to convince the "ladies" of our devotion to their interests, it was necessary that we should be continually devising some new feat that was to injure or take off their lovers or husbands, their fathers or their sons. The practical success of such inconsistencies may no doubt be chiefly dated from the circumstance that the future knight's education began at so early a period, that his mind as well as his body was moulded into the desired shape, before anything like independent action took place. In our account of the "Squire" from Chaucer,* Froissart's contemporary, we have had occasion to describe somewhat minutely the domestic education of the young aspirant, almost from the period of infancy to that of manhood. The very interesting incident we are now about to transcribe forms a suitable appendix to that description, showing the ruder and more dangerous species of exercises which, like the tournament, and other well-

known chivalrous amusements of the period, kept up in the man the spirit of the boy, and, to use a modern phrase, gave us at least "an armed peace," whenever it was not exactly convenient to have war. Here is a "deed of arms," from Froissart; the Nicoter, that immediately following the peace concluded between De Montfort, duke of Brittany, and the king of France, in 1379, when the English, under the Duke of Buckingham, who had been acting in conjunction with the former, found it necessary to make the best of their way home:—

The Constable of France was as then in the Castle of Josselyn, a seven miles from Vannes, and he had given safe conduct to divers knights, English and Navarrese, to go by land to the garrison of Cherbourg, the which knights had served the Earl of Buckingham in his said voyage; and among other there was Sir Evan of Fitzwarren, Sir William Clinton, and Sir John Burley. They departed from Vannes, and took their way by the Castle of Josselyn, and there lodged in the town without the castle, thinking no more but to dine there and so depart; and when they were alighted at their lodgings, certain companions of the castle, knights and squires, came to see them as men-of-war oftentimes will do, and especially Englishmen and Frenchmen. And among the Frenchmen there was a very truth, but ye see well how we go through Boucmell on the breast, and the stroke did slide up to the

squire answered, "Nicholas, excuse you not by this and armed him therewith, and Nicholas did help to

brought into the place where we shall do deeds of arms: then behold them well, and choose which ye stroke, and saw how the truncheon stuck still, they

and I shall not refuse it, rather than we should not do deeds of arms.' Then Nicholas said how he would take advice, and show him his mind ere he departed:—

'And if be so that I may not do it now, and that the deed of arms will under which aye was, and I shall choose the other.' When Nicholas Clifford saw the Constable, they were both so sore met face, because of them that were there present and heard the matter; and he saw well how this John offered him so much reason, that he could not with his honesty refuse him. And moreover John said to him, 'Sir, take what part and what covenant ye will,
cause of that adventure, seeing how he should slay so valiant a man of arms. He that then had seen the Earl of March would have had pity to see what sorrow he made for his squire, for he loved him entirely. The Constable recomforted him, and said, 'I declare to you no man knoweth for nothing else; though this evil fortune be fallen on our squire, the Englishman is not to blame, for he cannot amend it!' Then the Constable said to the Englishmen, 'Sirs, let us go and dine: it is time;' and so the Constable, against their good will, had them with him to the castle to dinner, for he would not break his promise for the interest of his squire. The Earl of March,piteously for his squire, and Nicholas Clifford went to his lodging and would not dine in the castle, what for sorrow, and for doubt of the French squire's friends. But the Constable sent so for him, that it behoved him to go to the castle; and when he was come, the Constable said, 'Certainly, Nichipas, I believe verily, and see with my eyes. Nay, I was bereaved of my heir.' But I excuse you, ye cannot amend it: for, as God help me, if I had been in the same case as ye were in, ye have done nothing but I would have done the same, or more if I might; for better it is a man to grieve his enemy, than his enemy should grieve him: such be the adventures of arms!' so they sate down at the table and dined at their leisure.' It is scarcely necessary to add that the promised safe-conduct was fully given.

Night in Newfoundland.—At dusk I walked along on the sandy beach, but was soon stopped by great boulders and masses of rock, requiring a good light and steady footing. I sat down on one of these, and gave myself up to the contemplation of the wonders which my eyes beheld. The wind had sunk to a calm, and the sky was cloudless. Before me lay the lake, perfectly still, except where there was a ripple from a stray breath of air creeping across its surface; beyond it rose woody hills getting black with the shades of night; over these hills and through the trees no track of any kind could be detected. The water, not a stir among the woods, not the hum of a single insect, nor the voice of a single bird. I believe this utter stillness is characteristic of all American woods, in Newfoundland it is most remarkable: if you hold your breath, your ear cannot detect the slightest interruption to the dead and dreary silence. It may, perhaps, savour of affectation, but there was something most oppressive to my feelings in this utter absence of sound, and I rose to go back, when my eye was struck by the most brilliant aura I think I ever saw. A belt of yellow light rose in the north-east, and passing just above both the bears, it disappeared in the north-western horizon. It was not a perfect arch, but a sinuous band, and it had a regular onward motion, like that of a waving ribbon, proceeding from the north-east to the north-west. The northern edge, or base, of this belt was a clear and well-defined continuous mass of light, while upwards it faded away into faint parallel rays. These rays had no divergence, and seemed to shoot upwards to a greater or less height from a certain long narrow base or floor, the plane of which was most parallel to the surface of the earth. I could have likened it to a long and continued army of celestials spearmen, radiating from their own light, marching in dense array, with a regular sweeping course, and gradually unfolding themselves from a distant host massed together in the north-east, and passing out of sight beyond the horizon. The illusion was, a faint reflection of the central band a little distance on each side it, but more preceptibly on the outside, or towards the south, and this reflection followed the primary band in its long sinuosity, exhibiting the same occasional variations of brightness, and the same upward glancing of the light. I am sure the rays proceeded not from any point in the north, but shot upwards at right angles to the surface of the earth. I am not sure whether I render this description intelligible, but the effect to me was as if I was viewing a portion of a sinuous collar of light, at a great height above, but generally parallel to some parallel of latitude north of me, and thus encircling the pole of the earth, while from this collar perpendicular rays shot upwards. Thus both the archéd appearance of the band and the divergence or convergence of the rays, as the only cause should be the effect of perspective merely. At first the greatest mass of light was in the north-east, but it got less as the stream proceeded from it, without perceptibly increasing in the north-west. The effect of this brilliant exhibition in the sky reflected in the still surface of the lake that stretched away before me from the extreme, and I watched it till its brilliancy began to fade, and at length passed away.—Johnson's Excursions in and about Newfoundland.

Coral Reefs.—Few natural objects are so well calculated to excite wonder in the human mind as the coral constructions, in all their Protean forms, that surround the greater number of Polynesian islands, and which demonstrate so perfectly the power of natural to effect her works, when aided by the feeble and inefficient agents. It requires, indeed, an intimate acquaintance with the habits of the Lithophites, and ocular proofs of their labours, to credit what stupendous submarine reefs and islands, many miles in compass, are indebted for at least the entire outer visible structure to the secretary economy of these tiny architects. In such examples Raitetea is not deficient. On the contrary, she is indebted for a large share of her natural beauties, as well as commercial advantages, to the coral constructions which surround her shores. These constructions may be divided into two chief forms of reefs; of which the nature and use may be best understood by considering them under their natural divisions of a barrier, and a shore reef. The former encircles the island as a breakwater or sea-wall, at the distance of one and a half or two miles from the land; presenting on the outside of it, the reef is partly dry and accessible; but when the clear and smooth water, which in many parts does not exceed, and is often less than, a foot in depth; its outer margin shelves irregularly, and terminated abruptly in a deep channel of blue water. The channel (which is also continued round the island) furnishes a natural communication between the two reefs, as well as convenient passage for navigation. Coral islets, shools, or whatever other form the madrepore rock may assume, can be distinctly traced to one or the other of these apparently distinct reefs, but never occur as the productions of both conjointly. The outer or barrier reef is a rock, requiring a good light and steady footing. I sat down on its summit, or whatever other form the madreporic rock may assume, can be distinctly traced to one or the other of these apparently distinct reefs, but never occur as the productions of both conjointly. The outer or barrier reef is a rock, requiring a good light and steady footing. I sat down on its summit, or whatever other form the madreporic rock may assume, can be distinctly traced to one or the other of these apparently distinct reefs, but never occur as the productions of both conjointly.
The immense variety of boats which crowd the waters of China may be divided into two classes; those that have eyes, and those without them. To the former class belong the military and trading junks that navigate the "great sea." They are nearly in the shape of a new moon, and as clumsy a craft as could well be contrived, having sterns at least thirty feet above the water, and bows the third of that height. The Emperor not only affords no encouragement to improvement, but actually discourages it, in the execution of foreign port duties from junks constructed on improved principles. These vessels have always a great eye painted on each side of the bows. This usage had its origin probably in some superstition. If a Chinaman is questioned as to its cause, his reply is, "Have eye, can see, can saavey; no have eye, no can see, no can saavey."

The craft used upon the inland waters of China vary from the rudely constructed junk, down to the small "Sanpan." There are boats appropriated to pleasure parties called "Hwa-chow," i.e. a flower-boat: they are frequently occupied by the wealthy classes in summer evenings, and are for the most part stationary, being moored together in rows, secured by strong hempen cables. The material used in building boats in China is oak and teak: very little iron or copper is used, the bolts, knees, and staunchions being composed entirely of wood, as well as their ponderous anchors. The seams are all secured or payed (a nautical term) with chinam, which is a strong white substance like mortar, made from the Chinam-tree: it much resembles putty: becomes as firm as rock, and never starts, and the seams thus secured by it are perfectly safe and water-tight. The deck-planks of Chinese boats are never secured, although well contrived and dove-tailed into one another: they are made to take up at pleasure, as underneath are kept all the culinary utensils, spare cordage, and apparatus required.

The masts are made of bamboo, and the sails of rattan sewn together, and fastened to bamboo joints running parallel, so that the sails open in the manner of a fan, and can be reefed at pleasure by closing any of the joints, each angle having a rope or sheet attached which joins on to one which can be belayed at pleasure or held in the hand. The rudder is a large unwieldy affair, universally perforated with small holes, which may be set down as a wonder for the wise.

On the canals and the rivers of the interior, oars are used in addition to the sculls. Mr. Davis, in 'The Chinese,' thus describes them:—"The oars which they occasionally use towards the head of their boats, besides the scull abaft, are rather short, with broad blades. These are suspended with a loop on a strong peg at the side of the boat, and there is an advantage in its not being always necessary to unship them, as, when useless, they are drawn by the water close to the vessel's side, without any retarding effect. There is besides no friction, nor any noise in a rullock, and no encumbrance of oars within the boat."

The interior accommodations and fittings up of Chinese boats show great ingenuity, and are adapted in every way to comfort. Large coverings or awnings stretch fore and aft, made of bamboo and rattan, and consist of several divisions, which can be removed either altogether or separately at pleasure: they are quite impervious to the rays of the sun. In the large chop and flower boats there is a complete upper deck, which is again covered in with an awning: it communicates with the interior of the boat by short steps.

The interiors of the flower and hoppo boats are very tasteful, indeed they may be compared to floating pavilions: they are beautifully painted, and carpeted or have a fine floor-cloth of the Chinese manufacture; latticed windows containing exotic shrubs and flowers make the interior quite light; the large lanterns are hung in front, and the rear is fitted up with a kind of altar where the Joss (the Chinese deity) is placed. The large boats are divided into two or three compartments, one being dedicated to culinary purposes, the others as sleeping and sitting rooms, and where every
comfort is enjoyed the same as in a house on shore. Mr. Davis thus describes one more particularly:—

"The travelling barges used by mandarins and opulent persons afford a degree of comfort and accommodation quite unknown in boats of the same description elsewhere; but it must be repeated, that speed is a quality which they do not possess. The roof is not less than seven or eight feet in height, and the principal accommodations consist of an ante-room at the head for servants, a sitting-room about the centre of the boat, and a sleeping apartment and closet abaft. All the cooking goes on upon the high overhanging stern, where the crew also are accommodated. There are gangways of boards on each side of the vessel, which serve for poling it along the shallows, by means of very long and light bamboos, and which also allow of the servants and crew passing from head to stern without incommending the inmates. The better boats are very well lit by glass windows at the sides, or by the thin interior laminæ of oyster-shells. Others have transparent paper or gauze, on which are painted flowers, birds, and other devices, while the partitions, or bulk-heads, of the apartments are varnished and gilded. The decks or floors of the cabins are square compartments, and admit of all the baggage being stowed away in the hold. Everything in their river-boats is kept remarkably clean, and this habit presents a strong contrast to their general neglect of cleanliness in their houses on shore, which have not the same ready access to water, and are besides often very ill drained. In short, their travelling barges are as much superior to the crank and ricketty budgerows of India, as our Europeanships are to these sea-junks of the Chinese, who seem to have reserved all their ingenuity for their river craft, and to have afforded as little encouragement as possible to maritime or foreign adventure."

The trading junks are very unwieldy, and having very little keel, besides being so bluff in the stern and stern, will only sail before the wind, therefore they perform their voyages alternately with the S.W. and N.E. monsoons. One of these boats is described as follows by Mr. Davis, in his 'Sketches of China':—"The most remarkable objects that struck us here were some enormous large salt-junks, of a very singular shape, approaching to a crescent, with sterns at least thirty feet out of the water, and bows that were two-thirds of that height. They had 'bright sides,' that is, were varnished over the natural wood without painting, a very common style in China."

The boats called 'Tsau-chuen,' and used on the grand canal for the conveyance of grain, are very numerous; there are said to be no less than one thousand belonging to the government; they average about two thousand pucks, or above a hundred tons, but being flat-bottomed, and very high out of the water, they have the appearance of a much greater capacity. The small 'Sanpan,' or family-boat, are by far the most numerous. Of this description there are innumerable, forty thousand on the Canton river near the city, containing a population of more than two hundred thousand souls. These boats are regularly licensed by government. The husband finds employment on shore, while the wife has charge of the floating domicile. These women seek a maintenance in carrying passengers to the neighbouring places. The cleanliness of their boats is remarkable. The late Dr. Morrison speaking of this tribe of people (Tan-hoo), who at Canton live entirely in boats, says:—"They were originally fishermen, who came from the south to Canton. They seem to have been named from the figure of their boats resembling an egg." These boats are from fifteen to twenty feet in length. Some of the old accounts of Canton say, that "on the river live many thousand souls, who never were permitted to come on shore," and these are descendants of Tartars. The people who live in boats originally came from the south, and being a foreign race, were not permitted to dwell on shore; but most of the distinctions between them and the rest of the people were removed by the Emperor Kien-lung, under the influence of general principles of equity.

The chop-boats are employed as lighters in transporting cargoes up and down the river, to and from foreign vessels at Whampoa.

**ON THE NATURE AND MANUFACTURE OF VELVET.**

From the time when velvet was first employed as a material for dress, its beautiful texture has always been greatly admired; indeed, there is perhaps no other manufactured fabric which can equal it for softness and delicacy. As a variety of the silk manufacture, it may be deemed comparatively modern, since many centuries appear to have elapsed after the introduction of plain woven silks, before velvet was heard
of. Mr. Porter, in his 'Treatise on the Silk Manufacture,' states that the manufacture of velvet was for a long time confined to Italy, where, particularly in Florence, Milan, Venice, Lucca, and Genoa, it was carried on to a great extent, and with a considerable degree of perfection. When, however, the French manufacturers took up this branch of silk-weaving, they speedily excelled their instructors; and it was from the refugees of that nation, when forced to leave their country by the revocation of the Edict of Nantes, in the year 1685, that the art of weaving became known and domesticated in Spitalfields, where it has since continued with varying degrees of success. The same cause having driven another portion of the French Protestants to Holland, the knowledge and prosecution of the manufacture became located there also.

At Haarlem, especially, a very considerable establishment was formed with this object in view; but its productions were never brought successfully to rival the beauty of French velvets, which continued for a long time to command a greater price in foreign markets than those of any other country.

It is necessary here to mention, in various records of the thirteenth century, under the Latin name of eclipso, and the French name of velouta. The latter name, derived from velo, 'hairy,' or 'covered with hair,' indicates in some degree the nature of the texture; since the peculiar softness of velvet is owing to a loose 'pile,' or surface of threads, unlike with the needle impales the sharp varieties of silk goods. It need hardly be remarked that plain silks, as well as most woven fabrics, consist of threads crossing each other at right angles; the 'long-threads' being technically called the warp, and the 'cross-threads' the shoot or weft. But it is evident at a glance that velvet possesses an additional feature in its construction. The back of the velvet exhibits the characteristic appearance, as well as that remarkable softness to the touch which distinguishes it from all other woven fabrics, and which, while it would be difficult to explain them in any intelligible terms, have themselves served for describing other bodies which present appearances or qualities somewhat similar. The beauty of the surface results in a great degree from the uniform evenness of the 'pile,' while this evenness depends upon the perfect equality in the length of the threads composing the pile; any irregularities detract very considerably from the market value of the goods, and hence the weaver has a motive for extreme care in the prosecution of this branch of manufacture.

The insertion of the short threads which form the pile must necessarily be effected in the weaving itself; and this is done in a manner which we proceed to describe. Instead of having only one row of warp-threads, which will be crossed alternately over and under by the shoot, there are two sets, one of which is to form the regular warp, while the other is to constitute the pile; and these two sets are so arranged in the loom as to be kept separate from one another. The quantity of warp-threads necessary is very much more than that of the warp-threads; and therefore must be supplied to the loom by a different agency.

If the pile-threads were worked in among the shoot in the same way as the warp-threads, the fabric would be simply a kind of double silk, but without any kind of pile; the pile-threads are therefore formed into a series of loops, standing up from the surface of the silk; and by subsequently cutting these loops with a sharp instrument, the pile is produced. The loops are formed in a very singular way. After the weaver has thrown the shuttle three times across, making the shoot interlace three times among the threads of the warp, he inserts a thin straight brass wire at right angles to the length of the piece, or parallel with the shoot. This wire is so placed as to occupy a position above the whole breadth of the fabric, above the warp-threads and below the pile-threads. The thread is then put to work, the alternate threads of the warp raised, and the shuttle again thrown; by which a shoot-thread is thrown over the pile-threads, and also over one-half of the warp-threads; the wire becomes thus, as it were, woven into the substance of the fabric. Two more traverses of the shoot are then made, passing alternately under and over the warp-threads in the usual way, but not interfering with the pile-threads. Another wire is then laid in, below all the pile-threads and above all the warp-threads, and this is secured by subsequent shoot-threads, as in the first case.

Thus we have a slightly portion of woven silk, with two brass wires inserted among it; and by a most delicate and difficult operation, these wires are removed by the same operation which produces the raised pile. Each wire is nearly a semi-cylinder in form, and has along its upper surface a carefully constructed groove, and along this groove the weaver passes the sharp edges of the brass wire, called a trevat, severing the pile-threads in his progress.

It necessarily follows from this operation that two ends of each thread are thus loosened, and these ends, being afterwards brushed up and dressed, constitute a portion of the pile, sufficiently long to hide completely the woven fabric beneath. Two wires are employed, on purpose if one only existed the pile-threads would become disarranged when it was removed. When the liberated wire has been again inserted, and three shoots thrown to secure it, the second line of loops is cut and the second wire removed; and so on during the weaving of the whole length. The slowness and delicacy of this branch of manufacture may be judged from the fact that forty or fifty insertions of the grooved wire are made in the space of one inch of the pile being cut an equal number of times. In addition to the other complications, the weaver has to use two shoot-threads, and consequently two shuttles; for the shoot thrown immediately after the insertion of the wire is stouter than the two following. Mr. Porter thus speaks of the unintermitting carefulness required in the successions of operations on the part of the weaver:—"The use of the trevat in cutting the pile calls for a certain amount of skillfulness or sleight of hand, only to be fully acquired through care and after long practice, while the minutest deviation from the proper line in performing this part of the process would infallibly injure, if even it did not destroy the goods; and the movements of the weaver in the entire operation are so numerous and require such constant changing of the hand from one action to another, that the weaver is greatly and unavoidably retarded in his progress. It is considered to amount to a very good day's work when as much as one yard of plain velvet has been woven. For this the workman is usually paid for five times the price charged for weaving gros-de-Naples."
owe their peculiar appearance to some of the pile-things being left uncut. The number of threads thus left depends on the width of the stripe; and it follows, from the nature of the arrangement, that the stripe runs cross-way of the velvet, or in the direction of the shoot.

Instead of silk, cotton has been employed within the last few years as a material for velvet, or rather for a fabric bearing some faint resemblance to velvet; but the difference between them is so great, that 'cotton velvet' can only be used a times, in places where temporary appearance is required rather than durability. It is, in fact, one of those numerous attempts at cheapness which have resulted from the cotton manufacture. There are, however, other varieties of cotton goods, resembling velvet in the circumstance of having a pile or nap, but possessing a strength and durability which render them very valuable as materials for coarse clothing; we mean the different varieties of fustian, of which a word or two may here be said.

There are a great many cotton fabrics, differing slightly from one another, but forming collectively a class very different from all such goods as calico; this class has been sometimes called fustian, for want of a more comprehensible name. In most of these kinds, a 'flushing,' or portion of the shoot-thread, is left, so that when cut they may produce a pile or nap. Some flushed patterns are produced by extra warp or weft, either coarser than the ground or of a different colour; others proceed from certain portions of the shoot which are floated above or below the warp. Smooth fustians, when cropped or shorn before dying, are called moleskin, and form a material which has been used within the last few years for trousers. When shorn after being dyed, they obtain the name of beaver-some of these countries, and in others none at all, the supply of water is very moderate, it does not give

When west of 64° W. long. As very little rain falls in some of these countries, and in others none at all, the rivers are supplied by water by the rains which fall at certain seasons on the mountains in which they originate, and by the springs which exist there. But as the supply of water is very moderate, it does not give force sufficient to the currents to carry them through those extensive tracts which separate them from the sea. It is remarkable that some of these rivers and all the lakes in which they terminate are salt in South America; and it is probable that this is also the case with most of those on the American continent.

Most rivers overflow the low countries which are adjacent to their banks, either at regular seasons of the year or occasionally. This takes place when the supply of water is greater than the bed of the river can contain. In this respect rivers may be divided into three classes: the first comprehends the rivers whose inundations are produced by the melting of snow and ice; the second comprehends those which are annually swollen by regular rains; and the third those which only occasionally cause inundations.

All large rivers that drain countries of which the mean winter temperature is below 30°, are annually subject to great risings when the snow and ice melt. In such countries snow falls for several months, and as only a small part of it is dissolved, it accumulates to a great amount. As soon as the frost ceases, the snow begins to melt, and runs off by the smaller rivers, which suddenly swell and carry an unusual supply of water to the principal river, whose volume, being thus increased to three or four times its ordinary magnitude, overflows the adjacent low country. These inundations, though they generally improve the soil, are very injurious to agriculture, by destroying the growing corn, and covering extensive tracts with sand, gravel, and other coarse earthy matter. Embankments are usually made to prevent these inundations, but after a very long winter, when the river is more than
usually swollen, these embankments are often destroyed, and the injurious effects of these inundations are increased by the mass of earthy materials of which they are composed, and which are dispersed over the adjacent lands. In some rivers these inundations last only from two to four weeks; in others two or three months; and in some even five or six months. Where the inundations are long, they are less violent, and cause less damage than where they are short; in the latter case the whole mass of water suddenly descends, whereas, if longer, it rises slowly. This difference in the inundations of rivers is mainly to be attributed to the direction in which they flow. Let us take a river like the Mississippi, which flows from north to south through 17° or 18° of latitude. In winter the basin is covered with snow, and if the whole were melted in a few days, it would produce a volume of water as much as would probably cover nearly half the basin. But the melting of the snow is gradual. Whilst the temperature in the northern districts is below the freezing-point, the spring has already made considerable progress in the southern districts, the snow which has there fallen has been dissolved, and the water thus produced has had its requisite time to run off and reach the sea. Thus with the progress of the sun towards the tropic, the line of the melting snow proceeds northward, and thus the supply of water runs off gradually, until the snow of the most northern region is dissolved. More than two months elapse between the melting of the snow in the northern region and the commencement of the melting in the lower part of the river. The inundations of the Mississippi therefore are not extensive, if the great length of that river and of its affluents are considered, but they last from three to four months. A considerable part of the delta of that river is indeed under water for six months, but this must be ascribed to the tract of elevated ground which extends along the banks, and which forms many miles in extent covering the more elevated La Fourche, and prevents the tremendous mass of water from reaching the mouth of the river and proceeding by depositing on them a fine mud, which enriches the soil more than the best manure. Whenever the inundations do not rise to the usual height, which is sometimes the case, a great part of the country which is not covered with water yields little or nothing, and the consequence is dearth and famine. When, on the other hand, the inundations rise higher than usual, they are also injurious to rural economy, by reaching those tracts which are set apart for the cultivation of plants which cannot bear so much moisture as the districts which are regularly flooded. Thus, in 1831, the river Menam in Siam rose to an extraordinary height; the inundations reached the large orchards which for many miles in extent cover the more elevated tracts along the banks, and deprived the inhabitants of a numerous population. Several kinds of fruit-trees were almost destroyed, and for some years the mangustans and durians were scarce.

All the rivers between the tropics which are swollen by periodical rains lie only in one hemisphere, the northern or the southern. In the countries through which they flow the waters are low and the ground dry during part of the year, in order to admit of easy cultivation, and at another season the fields are fertilised by the inundations. The Amazonas alone is an exception. Though the course of this river is in the southern hemisphere, its affluents extend far to the north and south, into both hemispheres, and probably three-fourths of the tropical rains which descend upon South America find their way to that large river. To this circumstance are owing its immense volume of water and its great depth. The Amazonas, properly speaking, is never at its lowest level, in the sense in which that term is applied to other rivers. When the northern rivers cease to bring down the supply which is owing to the periodical rains, the southern begin to exert their continuous water supply, and thus enable the rivers to explain the immense tracts of alluvial soil which extend along the river to a great distance, but the same circumstance also keeps the soil in a state of continual moisture, and makes it a perpetual swamp. Accordingly we find that the banks of that river, which admits of a more extensive navigation than any other in the world, remain nearly destitute of agricultural settlements, and are still in possession of savage tribes.

[To be continued.]
AFGHANISTAN.

The great road from Delhi to India and Persia passes through Attok and Peshawur to Caboul. Attok, a fortified place of no strength, contains a population of about 2000 souls, but its situation on the banks of the Indus, the ‘forbidden river’ of the Hindoos, is one of importance, as the river, which is here about two hundred and sixty yards wide, is crossed at this place. The ordinary passage is by ferry-boats, but an army exceeding five thousand men may be transported to the western bank of the river with greater facility by a bridge of boats. When the late Sir Alexander Burnes visited Afghanistan in 1832, Runjeet Sing had a fleet of thirty-seven boats at Attok, which were used for the passage of his troops. “The boats are anchored in the stream, a short distance from one another, and the communication is completed by planks, and covered with mud. . . . Such a bridge can only be thrown across the Indus from November to April, on account of the velocity of the stream being comparatively diminished at that season, and even then the manner of fixing the boats seems incredible. Skeleton frameworks of wood, filled with stones, to the weight of twenty-five thousand pounds, and bound strongly by ropes, are let down from each boat, though the depth exceeds thirty fathoms, and these are constantly strengthened by others to prevent accidents. Such a bridge has been completed in three days, but six is a much more usual period.”

Alexander the Great entered India by a bridge of boats across the Indus near this very place, and large wicker-baskets were used instead of timber framework, but with this exception the mode of effecting the passage was very similar to the one above described.

Fifty miles west of Attok is the city of Peshawur. It is situated in a plain of the same name, of nearly circular form, about thirty-five miles across, and is watered by three branches of the Caboul river and many minor streams. The latter are crossed by little bridges, which are usually ornamented by two small towers at each end. When Mr. Elphinstone was here in 1809, the population of the plain was very great, and one of the officers of the expedition took the bearing of thirty-two villages, all of which were within a circuit of four miles from the height where he was stationed. These villages were remarkable for their neatness, and were generally surrounded with trees. The orchards were rich with a profusion of plum, peach, apple, pear, quince, and pomegranate trees. At the time of Mr. Elphinstone’s visit the city of Peshawur contained a hundred thousand inhabitants, and its circumference was about five miles. He describes the houses as being generally three stories high, and built of unburnt bricks, in wooden frames, the lower story being commonly used as a shop; the streets as narrow, and sloping on each side towards the centre, and unfit for wheel-carriages; and the mosques numerous, though the only buildings deserving of much notice were the Bala Hissar, a castle of no great strength, and a large caravanserai. The shops abounded with dried fruit and nuts, bread, meat, boots, shoes, saddlery, bales of cloth, hardware, and ready-made clothes. The fruitiers’ shops were amongst the handsomest. Greens, curds, water in leathern bags, and various other things were carried about for sale in the streets. Mr. Elphinstone describes the crowds in the streets as composed of “the people of the town, in white turbans, some in large white or dark blue frocks, and others in sheepskin cloaks; Persians and Afghans in brown woolen tunics or flowing mantles, and caps of black sheepskin or coloured silk; Khyberees with the straw sandals, and the wild dress and air of their mountains; Hindoos, uniting the peculiar features and manners of their own nation, to the long beard and dress of the country; and Hazarehs, not more remarkable for their conical caps of skin, with the wool

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appearing like a fringe round the edge, and for their broad faces and little eyes, than for their want of the beard, which is the ornament of every other face in the city." In 1833 Runjet Sing fraudulently took possession of Peshawur, while he was negotiating a treaty with the chief. The place is a good deal decayed since 1833, and Sir Alexander Burnes doubted it, at the time of his visit, it contained one-half the hundred thousand souls which occupied it when Mr. Elphinstone was there. It now pays a yearly tribute to the sickhs. The soil of the plain is very rich, and is well adapted for cultivation by the spade. Three crops are gathered in the year, and of barley, reckoning two cuttings for horses before it is in ear, they may be said to except five months. Valleys are very cheap and plentiful, but prices have risen with the decrease of the population. Wheat was under 2s. a bushel when Sir Alexander Burnes was there; barley less than 1s.; a sheep could be had for 2s., and a bullock for about 25s. In one part of the plain a remarkable kind of rice is produced which is exported as a luxury to Persia, which other Central India. When boiled, the grains are three-fifths of an inch in length. The cultivation of the sugar-cane and the rearing of silk-worms might be successfully practised. The plain of Cohat, which is a subordinate district to Peshawur, contains gold, copper, iron, antimony, salt, sulphur; and lastly coal is found.

The plain of Peshawur is surrounded by hills on all sides except the cast, and the heat is in consequence very great during the summer, but it does not endure very long, and the country continues green all the year. Some of the common plants remind the traveller of England. "As we travelled the plain to Peshawur," says Sir Alexander Burnes, "I felt elevated and happy. Thyme and violets perfume the air, and the clear clover is in reock in the joyful country. The violet has the name of the 'Rose of the Prophet.' The dandelion and other of the familiar English plants are common." Mr. Elphinstone found the thermometer stand at 112° and 113° during several days in summer, in a large tent artificially cooled. Most of the houses are provided with cellars which serve as a retreat from the summer heat. Asia, the country possesses such diversity of temperature as Afghanistan, affected as it is by different degrees of elevation, by the neighbourhood of snow-capped mountains, by deserts over which the winds that blow over them in summer become heated, and in winter cold to excess. Sir Alexander Burnes describes Jellalabad from Peshawur, a distance of about seventy miles, we enter the valley of Caboul, watered by the river of the same name. This valley is in some parts about twenty-five miles in breadth, and separates the range of Hindoo Koosh from the Mountains of Solimauan. The river flows with great rapidity through this valley, and is swelled by the torrents which empty themselves into it from the mountains on either side. People descend it in rafts from Jellalabad to the plains of Peshawur, notwithstanding the great velocity of the current, and other dangers which attend the navigation. There are five different routes from Peshawur to Caboul, but the one by the Khyber Pass is unsafe on account of the lawless habits of the people, though on other accounts it is preferred, as a retreat from the sun and heat. The natives are invited to the Khyber Pass to secure his passage through this defile. The Khybers consist of three independent tribes, and number altogether about one hundred and twenty thousand souls. The country in which they inhabit is seated on the steep side of a lofty mountain, descending to bare and rugged hills, and comprising some rich valleys. The extremes of heat and cold are felt in summer and winter; and in situations which do not admit of a free circulation of the air, as well as on the naked hills, the heat becomes intolerable. The following account of the Khyber Pass which they command is from Mr. Elphinstone's work:—"The Khyber Pass is about twenty-five miles long, over steep ridges, and through very narrow defiles. The road is often along the beds of torrents, and is uncrossed than dangerous in the event of sudden falls of rain in winter. In quiet times the Khyberes have stations in different parts of the pass, to collect an authorised toll on passengers, but in times of trouble they are all on the alert. If a single traveller endeavours to make his way through, the noise of his horse's feet sounds up the long narrow valley, and soot on his face, Prussian blue is the cheapest matter and blue blood. These are all the ravines; but if they expect a caravan, they assemble in hundreds on the side of a hill, and sit patiently with their matchlocks in their hands watching its approach." It was through this pass that the British troops marched from Peshawur to Jellalabad. The same writer says:—"The Khyberes are lean, but muscular men, with long gaunt faces, high noses and cheek-bones, and black complexions. They wear, in winter at least, dark blue turbans, and long dark blue tunics sitting close to the body, but reaching to the middle of the leg. They wear neat sandals of straw, or the leaf of the dwarf palm; carry matchlocks, with a wooden fork attached to the barrel, for a rest, swords, and short spears; and have altogether an appearance so strange and un GIT"
In passing from Jellalabad to Caboul the first place which is reached is Bala-bagh, near which, lying under the snowy mountains, are the rich gardens that produce the seedless pomegranates that are exported to India. At Gundamuck, some miles farther, is the boundary of the hot and cold countries; and snow is sugar-candy, a bulky and not very valuable commodity. It had been brought from China to Bombay, shipped from thence to Bushire in the Persian Gulf, and then sent inland to Tehran and the banks of the Caspian, where it was a third time embarked; and after being relanded at Oka, ten days' journey from Khiva, it would be transported by hired camels belonging to the Tobkey Bokhara, for the purpose of delivering it to the Bokhara market, and there it would meet the sugar of the British West Indies brought by the Russians, thus bringing the productions of America and China into competition in the centre of Asia. If the reader will take the trouble to trace the route from China to Khiva on the map, the instance here recorded will certainly strike him as a singular proof of mercantile perseverance and enterprise.

ON COSMORAMAS, DIORAMAS, AND PANORAMAS.

There are several curious and instructive points involved in the process of deception whereby a flat painted surface is made to represent existing objects. When we look at a well-painted picture, bordered with a frame and hanging up at the side of a room, we do not mistake the object at which we are looking, because there are certain accessories at hand which can only pertain to it as a picture; but if these accessories are removed, the mind is more and more prone to be deceived in proportion as the artist is skilful. If the perspective be accurate, if the colours be faithful, objects represented correspond with those observed in nature, if the grouping and general arrangement be natural, and if attention be paid to the modifying tint which results from the state of the atmosphere at different times of the day, the eye will be affected, and through it the mind, nearly in the same way as by the original objects themselves. But in order that this effect may be wrought, the eye must not be distracted by other objects which can only belong to the picture and not to the original.

Within the last few years many attempts have been successfully made to produce the effect here indicated, and to dispel the illusion under which the senses lie. The two words Diorama and Panorama are representatives of two of the most successful and pleasing of these methods; but there is another, the Cosmorama, which may be first noticed, as it depends on a principle somewhat different from the others. Dr. Arnott, speaking of the illusive optical effects of pictures, remarks: "Common paintings and prints may be considered as parts of a panoramic representation, showing as much of that general field of view which always surrounds a spectator, as can be seen by the eye turned in one direction, and looking through a window or other opening. The pleasure from contemplating these is much increased by using a lens."

After describing the use of such a lens in the optical toy called the "diagonal mirror," and in the common "puppet-show" of the streets, he proceeds:—"A still more perfect contrivance of the same kind has been exhibited for some time in London and Paris under the title of Cosmorama (from Greek words signifying views of the world, because of the vast variety of views. Pictures of moderate size are placed beyond what have the appearance of common windows, but of which the panes are really large convex lenses fitted to correct the errors of appearance which the nearness of the
pictures would else produce. Then by using further subordinate contrivances calculated to aid and heighten the effects, even shrewd judges have been led to suppose the small pictures behind the glasses to be wondrously beautiful, while the spectators have in eyes dwell upon them with admiration, as magical realizations of the natural scenes and objects. Because this contrivance is cheap and simple, many persons affect to despise it; but they do not thereby show their wisdom; for to have made so perfect a representation of objects is one of the most sublime triumphs of art, whether we regard the pictures drawn in such true perspective, or the lenses which assist the eye in examining them."

From the details above given it appears that the effect is principally due to the magnifying power of the lens, by which the picture is made to appear very much larger than it really is. But this same effect is obtainable in a considerable degree without a glass by making the picture instead of being viewed in darkness, and light being thrown on the picture in such a way as to render the spectator to view the distant objects, just as in the case of the Diorama, an attentive observer will see that the illusion is universal, that a considerable degree without a glass by making the picture instead of being viewed in darkness, and light being thrown on the picture in such a way as to render the spectator to view the distant objects, just as in the case of the Diorama, an attentive observer will see that the illusion is universal, that the artist here has sketched the city of London, forming the main part of the exhibition of the Colosseum, in the Regent's Park. Here we have a picture covering no less an area than forty thousand square feet of canvas, representing the immense world of London as seen from the outer galleries of St. Paul's Cathedral. When the upper part of the scene is shown, the sun is shining strongly towards one part of the picture, call for considerable tact and judgment.

Panoramic pictures are said to have been first devised by Barker about half a century ago; and Mr. Burford has of late years produced panoramas which have gratified artists and connoisseurs as much as the Diorama and the Cosmorama. The painter has been elevated to these galleries by ingenious mechanisms, and then viewed the picture under different aspects, according to the gallery which they occupied. The boundary of the visible horizon represented on the picture is nearly a hundred and thirty miles in circumference; and so minute is the pictorial execution, that magnifying-glasses are provided for the spectator to view the distant objects, just as in the distant contemplation of the natural view. Here, as in the case of the Diorama, an attentive observer will see that everything is removed which can tend to break the spell, to dispel the illusion, under which the senses temporarily lie; we are not permitted to see the top of the picture, nor the bottom of the picture, nor the floor of the great rotunda, nor the skylights; nor are we allowed to pass from one to another. We have therefore no standard with which to compare the picture, and thus it ceases to appear like a picture.
COVENTRY MYSTERIES.

The Miracle Plays of England, whose well-authenticated antiquity extends as far back as the early part of the twelfth century, formed no doubt the foundation of the present English Drama. Though rude in conception, and intended to promote religious feelings in at least an equal degree with amusement among the people, the delight felt by the spectators in the visible representation of events, the approbation with which temporal events, existing manners, and human characters and passions were received, as by degrees they were gradually introduced, produced a taste for the theatrical representation, which had probably reached its height about the period when the greatest dramatist of this or any other country arose to gratify their wants by developing with the most consummate art and the highest ability the capabilities of the drama. These early plays or pageants are therefore objects of legitimate curiosity, and we purpose to give a short account of the most complete remaining collection of them, the 'Ludus Coventrinæ' or Coventry Plays, (of which the MS. is in the British Museum, and is at least as old as the reign of Henry VII.,) for which we are indebted to the 'Penny Cyclopædia.' These plays, we may add, were performed to as late a period as 1591.


There is abundant evidence that the Romish ecclesiastics, in their first introduction of this kind of representations, especially that part of them relating to the birth, passion, and resurrection of Christ, had the
perfectly serious intention of strengthening the faith of the multitude in the fundamental doctrines of their church; and it seems the less extraordinary that they should have resorted to this expedient, when we reflect that before the invention of printing, books had no existence for the people at large. But it is no less certain that the repetition of these exhibitions rapidly worked upon the popular mind an effect which, if possible, was not less forceful than the theological representations of the early Christians, which we shall have occasion to notice in the next number of this periodical. Thus, to get up one of these extensive shows or pageants, they attempted to add, according to their barbarous ability, embellishment after embellishment to the simple copies which they had originally presented. The reason why this longer class of performances was of Tridentine and the Grey Friars’ Gate on the south, and from undertaking a portion of the performance and sustaining the expenses. The authentic information regarding this long period of the church is almost wholly confined, in England as well as on the Continent, to the larger cities.

The seasons for exhibiting the grand scriptural plays were chiefly the Christmas and the Whitsun holidays. The getting up and acting of these in the great cities early devolved upon the trading companies, each guild undertaking a portion of the performance and sustaining a share of the expense. The authentic information of themultitudeof the later middle ages.

These considerations will sufficiently account for one remarkable feature in these performances, the early drama of modern Europe presents to the early Greek drama, though both flowed directly from a religious source; that while in the latter a groundwork drawn from human history was adorned and elevated by mythological intermixtures; in the middle age drama, on the contrary, the basis or substratum was religious, but so overlaid with allusion to the twelve apostles, and renowned virgins, especially St. Catherine and St. Margaret. The Reformations had begun, as a matter of fact, in these productions, as, also, it certainly became the primary object of the greater part of the ecclesiastics who took part in getting them up. These two facts are shown with the utmost clearness by the collective testimony of all the contemporary writers who have thrown a general light upon the manners of the later middle ages.

Now, let us return to the very beginning of this period, the time at which the performance was first thought of. Some of the Chester pieces required, as Mr. C. Knight’s ‘William Shakspere: a Biography,’ beginning have been intended to characterize the performance. The proclamation of the Chester plays, which was read over in various parts of the city of St. George’s day, before the commencement of the performance, is a remarkable instance of things not warranted by any writ,” on the ground that it was done “to make sport” and to “glad the hearers.” The dialogue in these productions was, for the most part, extremely rude and artificial; and as to plot, they cannot properly be said to have had any. It is not until the middle of the sixteenth century that we arrive at a scriptural play having anything approaching a regular dramatic action. In this respect the series of plays which we have been considering should rather be described as a series of shows or pageants exhibited in succession, but without any artificial connection. Each of these detached divisions of the representation was indeed commonly called a “pageant;” and each succeeding play or pageant of the series was supported by a new set of performers. Thus, to get up one of these extensive sets of plays, it was necessary to provide and prepare a large number of actors; and here we see one manifest reason why this longer class of performances was almost wholly confined, in England as well as on the Continent, to the larger cities.

The seasons for exhibiting the grand scriptural plays were chiefly the Christmas and the Whitsun holidays. The getting up and acting of these in the great cities early devolved upon the trading companies, each guild undertook a portion of the performance and sustaining a share of the expense. The authentic information regarding the exhibition of the Corpus Christi plays at Coventry extends from the year 1416 to 1591, during the whole of which period there is no indication that the clergy in any way co-operated. The pieces were acted on temporary erections of timber, called scaffolds or stages, and it appears that in some instances they were placed upon wheels, in order that they might be removed from one part to another of a large town, or from one place to another of a small one. The whole of this performance was compounded of a mixture of three things: first, the usual representation of the angel Gabriel lifting up the lily; the second, the playing of a didactic part, the doctrine being divided among the different companies, which the subjects were treated, from Mr. C. Knight’s ‘William Shakspere: a Biography,’

The morning of Corpus Christi comes, and soon after sunrise there is stir in the streets of Coventry. The old ordinances for this solemnity require that the Guilds should be at their posts at five o’clock. There is to be a solemn procession—formerly, indeed, after the performance of the pageant, thousands of torches burning around the figures of our Lady and St. John, candlesticks and chalices of silver, banners of velvet and canopies of silk, and the members of the Trinity Guild and the Corpus Christi Guild bearing their crucifixes and candlesticks, with personifications of the angel Gabriel lifting up the lily, the twelve apostles, and renowned virgins, especially St. Catherine and St. Margaret. The Reformation has, of course, destroyed much of this ceremonial; and, indeed, the spirit of it has in great part evaporated. But now, issuing from the many ways that lead to the Cross, there is heard the melody of harpers and the voice of minstrelsy; trumpets sound, banners wave, George’s day, before the commencement of the performance of one of these plays, giving at the moment of the miracle, the time a more distinct notion of the manner in which the subjects were treated, from Mr. C. Knight’s ‘William Shakspere: a Biography,’

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It is more than probable that the pageants performed by the Guilds were altogether different from the 'Ludus Coventriae,' which Dugdale expressly tells us were performed by the Grey Friars.

The messenger of Herod succeeds; and very curious it is, and characteristic of a period when the king's laws were delivered in the language of the Conqueror, that he speaks in French. This circumstance would carry back the date of the play to the reign of Edward III., though the language is occasionally modernized. We have then the three kings with their gifts. They are brought before Herod, who treats them courteously, but is inexorable in his cruel decree. Herod rages in the streets; but the flight into Egypt takes place, and then the massacre. The address of the women to the pitiless soldiers, imploring, defying, is not the least curious part of the performance; for example—

"Sir knights, of your courtesy, this day shame not your chivalry, but on my child have pity;"

is the mild address of one mother. Another raves—

"He that slays my child in sight, if that my strokes on him may light, be he squire or knight, I hold him but lost."

The fury of a third is more excessive:

"Sit he never so high in saddle, but I shall make his brains addle, and here with my pot ladle with him will I fight."

We have little doubt that he who described the horrors of a siege,—

"While the mad mothers with their howls confus'd do break the clouds, as did the wives of Jewry at Herod's bloody-hunting slaug'termen,"

had heard the howlings of the women in the Coventry pageant. And so "fynes lude de taylorz and scharmen," the pageants thus performed by the Guilds of Coventry were of various subjects, but all scriptural. The Smiths' pageant was the Crucifixion; and most curious are their accounts, from 1449 till the time of which we are speaking, for expenses of helmets for Herod and cloaks for Pilate; of tabards for Caiphas and gear for Pilate's wife; of a staff for the Demon, and a painted cloth presented a picture of the subject that was to be performed. It had its machinery, too; it was fitted for the representation of an earthquake or a storm; and the pageant in most cases was concluded in the noise and flame of fireworks. It is the pageant of the company of Shearmen and Tailors which is now to be performed,—the subject, the Birth of Christ and Offering of the Magi, with the Flight into Egypt and Murder of the Innocents. The cager multitudes are permitted to crowd within a reasonable distance of the car. There is a moveable scaffold erected for the more distinguished spectators. The men of the Guilds sit firm on their horses. Amidst the sound of harp and trumpet the curtains are withdrawn, and Isaiah appears, prophesying the blessing which is to come upon the earth. Gabriel announces to Mary the embassage upon which he is sent from Heaven. Then a dialogue between Mary and Joseph, and the scene changes to the field where shepherds are abiding in the darkness of the night—a night so dark that they know not where their sheep may be; they are cold and in great heaviness.

Then the star shines, and they hear the song of 'Gloria in excelsis Deo.' A soft melody of concealed music hushes even the whispers of the Coventry audience; and three songs are sung, such as may abide in the remembrance of the people, and be repeated by them at their Christmas festivals. The first the shepherds sing:

"As I rode out this ends* night, Of three jolly shepherds I saw a sight, And all about their fold a star shone bright; They sang terly, terlow: So merrily the shepherds their pipes can blow."

There is then a song 'the women sing':—

"Lully, lully, you little tiny child; By, by, lully, lulay, you little tiny child: By, by, lully, lulay.

O sisters two, how may we do For to preserve this day This poor youngling, for whom we do sing By, by, lully, lulay?

Hered the king, in his raging, Charged he hath this day Men of might, in his own sight, All young children to slay. That woe is me, poor child, for thee, And ever mourn and say, For thy parting neither say nor sing By, by, lully, lulay."

The shepherds again take up the song:

"Down from heaven, from heaven so high, Of angels there came a great company, With mirth, and joy, and great solemnity: They sang terly, terlow: So merrily the shepherds their pipes can blow."

The simple melody of these songs has come down to us; they are part songs, each having the treble, the tenor, and the bass. The star conducts the shepherds to the 'crib of poor repast,' where the child lies; and with a simplicity which is highly characteristic, one presents the child his pipe, the second his hat, and the third his mittens. Prophets now come, who declare in lengthened rhyme the wonder and the blessing:—

* Ends night—last night.
† This very curious Pageant, essentially different from the same portion of Scripture-history in the 'Ludus Coventriae,' is printed entire in Mr. Sharp's 'Dissertation, as well as the score of these songs.
ON RIVERS, GEOGRAPHICALLY CONSIDERED.

The rivers which drain the countries between 30° N. latitude and those in which the mean temperature of the winter season does not rise above 30°, are subject to occasional inundations. But these overflows often change the course of rivers, which are situated within mountain-ranges which are covered with snow for a considerable part of the year. In such cases, while the snow covers the more elevated portion of the mountains, a sudden change in the weather, which produces a warm wind, brings great volumes of vapours, which, falling in abundant rain, soon dissolve the snow, and the mountain-streams pour down their waters with increased volume and velocity. As soon as the waters reach a level tract, it is inundated. As these inundations often take place unexpectedly, they cause great damage. Thus we find that some valleys in the Ozark Mountains, in the United States of America, are almost uninhabitable, owing to the sudden inundations to which the rivers of that mountain-region are subject. Many rivers, however, never inundate the adjacent country, unless a heavy gale of wind should blow directly up the river, and drive the sea into it with great force. Such inundations are very sudden, and sometimes also extensive, but they are of short duration.

In advertising to the advantages which a country derives from rivers, we must observe that the water is extensively used for the purposes of domestic economy. It is much purer than that of wells; for, with the exception of a few which are salt or brackish, river water contains only earthy particles in suspension, which may easily be separated by filtration, and which are deposited as a sediment when the water is left to stand for a short time. The water of wells generally contains a small quantity of some mineral in chemical combination. The water of rivers is nearly equal to rain water for all domestic purposes. Rivers accordingly supply water for the consumption of large cities, as in the case of the New River, which supplies a large part of London, and the Schuylkill, which supplies Philadelphia. Many rivers also supply abundance of food. The upper courses of rivers are generally inhabited by a small number of species of fish, and the whole amount is not great. But towards their mouths the number both of species and individuals increases. The importance of a river fishery may be estimated when we consider the quantity of salmon which is taken in the rivers of Britain, or of the belugas and sturgeon which are caught in the neighbourhood of Astrakhan. Many rivers, which are not adapted to the purposes of navigation, are converted into powerful instruments for assisting the industry of a country by the moving-power which they supply for mills and other heavy machinery. The advantage of such a natural moving-power primarily determines the seat of manufactures, as was the case in South Lancashire, where this advantage is combined with abundance of coal. The Atlantic states of North America are generally provided with abundance of streams, a circumstance which favours the establishment of manufactures.

The greatest advantages, however, which a country derives from its rivers are the facilities which they supply for conveying the produce of agriculture and of manufacturing industry to distant parts at a moderate expense. In this respect the rivers may be compared to the arteries and veins of the human body, which diffuse life and strength through all parts. Navigable rivers vivify, maintain, and excite the efforts of human industry. In many countries, where roads are neglected, it is estimated that the transportation of goods by land is four times as expensive as that by means of navigable rivers, and thus many heavy and bulky commodities could not be brought to market but for the cheap conveyance of rivers. In considering the capacity of a river for navigation, two circumstances mainly require notice—how far seafaring vessels may ascend, and how far the river is navigable for river boats.

Seafaring vessels can ascend many rivers as far as the tides extend. Indeed some rivers, as the Amazonas, may be navigated by large vessels to a much greater distance than the tide ascends, but in others the waters become shallow long before the limit of tide-water is reached. Still high tides facilitate the navigation of rivers by large vessels not only by producing a current contrary to that of the river, but also by temporarily increasing the depth of water, so that vessels can pass over shallows and sandbanks which at low tides are nearly or quite dry. This is frequently the case in rivers where the tides rise more than twelve feet. The tides in rivers are not of equal duration, as is the case in most parts of the sea, but they frequently last twice as long as the ebb and flowing tides. At Rotterdam the tide flows for about four hours and five minutes, but the ebb lasts seven hours and fifty-five minutes. The Meerwede at Dordrecht flows against the current of the river for three hours and fifty-one minutes, and with it eight hours and nine minutes. This difference is easily explained when we consider that one side of the river is subject to the flowing of tide-water, while the other is subject to the ebb tides. The ebb tides sometimes last nearly twice as long as the flowing tides.

The ebb tides frequently last twice as long as the flowing tides. Between the North Sea and Hamburgh the flowing tide takes five minutes to run up a mile, but the ebb tide performs the same distance in less than four minutes. But it is difficult to explain the well-established fact that the tides advance much farther into a river than they might be produced. When the mouth of a river rises four feet, we might suppose that it would advance to such a point in the river where the surface is four feet above the sea, but it has been ascertained that it advances farther. It seems that the volume of water which is carried up by the tide is pushed onwards by the mass behind it, and carried to a greater distance than the inclination of the river bed would seem to allow. It has also been observed, that during the flowing of the tide the surface of the water in the river presents a somewhat convex form, the water along the banks being a little lower than in the middle of the river, and that during the ebb the contrary takes place. The flowing tide raises the water from below, and thus sooner affects the main body of the river, while the ebb tide does not. The flowing tide near the margin. In accordance with this explanation, it is observed that the flowing tide is perceptible in the middle, while it is still ebbing along the banks, and that vessels which are at anchor near the banks are turned round before the water on the surface of the river near the banks begins to flow upwards.

Bears Fishing.—During the height of the fishing season the salmon are so plentiful in all the rivers and creeks of Kamchatka, that the bears catch them with the greatest ease; and will only eat the heads and backs. The Kamchadals say that a large bear will spoil from twenty-five to thirty fish of a night. As the season advances, and the fish get scarcer, the bears become less choice in their food. Dobell's Kamchatka

THE PENNY MAGAZINE. [SEPTEMBER 17,
THE GREY MULLET.

One of the angler-poets, whom Walton loved to quote, says:

"I care not, I, to fish in seas;
Fresh rivers best my mind do please,
Whose sweet calm course I contemplate,
And seek in life to imitate."

But the grey mullet only ascends and descends rivers with the flow and ebb of the sea. Away, therefore, must we go from "the brink of Trent or Avon," where the angler's pleasure is to see his

"— quill or cork down sink
With eager bite of perch, or bleak, or dace."

The grey mullet haunts the shallow waters on the coast, never going far from land; and though it ventures up rivers, it invariably returns with the tide. There are six places in Sussex, according to a saying probably many centuries old, each of which is celebrated for a particular kind of fish; and Arundel, one of these places, is distinguished for its mullets. The town is ten miles from the sea; but Mr. Yarrell mentions, as a remarkable circumstance, that, in 1834, the grey mullet was taken ten miles higher up the Arun, at Bambergh Castle, which is twenty miles from the sea. Walton does not once mention having angled for the grey mullet, but had he done so, the sport would have called into exercise all his skill and all his patience; for so careful is it not to swallow any large or hard substance, that it has a trick of getting the bait into its mouth and of rejecting it if suspicion be at all excited. Even if hooked, it is often only in the lips, and it then plunges with much violence, and often effects its escape. The grey mullet spawns about Midsummer. The general colour of the adult is a darkish grey, with a tinge of blue, and the sides and belly, which are white, are marked by dark longitudinal lines. The form of the mouth is very peculiar, and is thus described by Mr. Yarrell:—"The lower jaw is divided in the middle by an ascending angular point, which, when the mouth is closed, passes within the upper jaw; the upper jaw also, if viewed from below, is likewise angular." Besides the grey mullet there are two other species, the thick-lipped grey mullet, which abounds in considerable numbers on the coast of Cornwall, and another, of which Mr. Yarrell caught a specimen at the mouth of Poole harbour, which is remarkable for the shortness of its form. Cuvier remarked that the species of European mullets had probably not been well ascertained. The mullet for which the Romans gave such extravagant prices for their entertainments, is altogether a different species.

By experiments which have been made for ascertaining whether salt-water fish could be kept in ponds of fresh-water, it has been found that the grey mullet has actually improved. Some fry were put into a pond of three acres in Guernsey, when about three inches in length, and in four years they weighed four pounds, and were "fatter, deeper, and heavier than those obtained from the sea."

Mr. Couch, a Cornish gentleman, who has paid great attention to the habits of fish on the shores of the county in which he resides, communicated some interesting facts respecting the grey mullet for Mr. Yarrell's valuable work on 'British Fishes.' When

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enslaved within a ground-sean or sweep-net, as soon as the danger is seen, and before the limits of its range are straitened, and when even the end of the net might be passed, it is its common habit to prefer the shorter course, and throw itself over the head-lines and so escape; and when one of the company passes, all immediately follow." Mr. Couch adds:—"This disposition is so innate in the grey mullet, that when young ones of minute size may be seen tumbling themselves head over tail in their active exertions to pass the head-line. I have even known a mullet less than an twelvedeniers; but under the decimalsystem, the headovertailintheiractiveexertionstopassthe thelivrebeingequaltotwentysous, and thesouto inchinlengththrowitselfrepeatedlyoverthesideoffranc ismade nearlyequalto theold livre, and isa cup inwhichthewaterwasan inchbelowthebrim." subdivideddecimally, sothattendécimes make a franc,

**DECIMAL DIVISION OF THE COINAGE.**

Those who are unaccustomed to the use of decimal arithmetic are scarcely aware of the vast waste of time entailed in commercial calculations by the want of a decimal subdivision of the coinage, in the place of the system now acted on. The subject was slightly touched upon in an article on the ‘Simplification of Arithmetic Rules,’ in our second volume; but in the nine years which have since elapsed, various plans have been proposed, which merit a little of our attention.

In all decimal arrangements, each term in a quantity is ten times as great as the term next below it, so that all the terms form a series increasing by a regular law. But in the common English coinage, or in monetary accounts, we use four terms or denominations differing materially in their rate of increase. Our largest denomination or unit is the pound sterling; then the next is a twentieth part of this, viz. the shilling; the third in the series is a twelfth of the shilling, and the penny, the twelfth thus obtained, is divided into four parts to obtain the lowest denomination, or farthing; hence we have three rates of increase, according as the multipliers or divisors are 20, 12, or 4. The complexity is shown most when we have to multiply a sum of money by any number. Suppose, for instance, that we purchase twenty-five articles, at 112s.6d. each; we have first to multiply the pence by 25, and find how many shillings and remaining pence there are; then to multiply the shillings by 25, adding them to the shillings derived from the previous multiplication; and, lastly, to multiply the pounds by 25, increasing the product by the pounds derived from the preceding multiplier. But if the sum of 1l. 2s. 6d. were put in the decimal form £1·25, the problem would be one of plain multiplication, thus:

\[ 1 \times 125 = 125 \]

without the puzzling operation of reducing from one denomination to another. If 10 farthings made a penny (or a crown) by any other means, and 10 shillings a pound, then the decimally-expressed quantity £1·125 would be one pound, one shilling, two pence, and five farthings.

But the great obstacle to any changes of this kind is the tenacity with which ancient customs are adhered to. That four farthings make a penny, twelve pence a shilling, and twenty shillings a pound, are truisms so imbedded into the mind from childhood, that any attempt to eradicate them will be attended with much difficulty. In France, when the decimal notation became introduced in weights and measures, it was almost a natural consequence that similar changes should be effected in the coinage. Under the old system, accounts were kept in livres, sous, and deniers, the livre being equal to twenty sous, and the sou to twelve deniers; but under the decimal system, the franc is made nearly equal to the old livre, and is subdivided decimally, so that ten dècimes make a franc, and ten centimes make a décime. In the United States, too, accounts are simplified by expressing sums of money in “dollars” and “cents” or hundredths of dollars; thus a sum equal to a dollar and three-quarters (7s. 7d. English) is expressed $1.75. It is not so much in the actual passage of money from hand to hand that any inconvenience or delay arises under the present system, as in the computation or keeping of commercial accounts, in which a saving of figures written is followed by much time gained.

Mr. Babbage, in the second edition of his ‘Economy of Manufactures,’ introduced a chapter on “Money as a Medium of Exchange,” and therein remarks:—

“The subdivisions of money vary in different countries, and much time may be lost by an inconvenient system of division. The effect is felt in keeping of accounts, and particularly in calculating the interest on loans or the discount on bills of exchange.” He then proceeds to express an opinion, that the decimal system is the best adapted to facilitate all such calculations, and that the abolishing of the guinée, without which he produced any great inconvenience, is a proof that changes in the coinage, when a saving of figures written or of processes performed is so much time gained.

Mr. Babbage then proposes the following plan:—“If, whenever it becomes necessary to call in the half-crowns, a new coin of the value of two shillings were issued, which should be called by some name implying a unit (a prince, for instance), we should have the tenth part of a sovereign. A few years after, when the public were familiar with this coin, it might be divided into one hundred instead of ninety-six farthings; and it would then consist of twenty-five pence, each of which would be four per cent. less in value than the former penny. The shillings and sixpences then withdrawn from circulation might be supplied with silver coins, each five of the new pence, and by others of ten-pence, and two-pence halfpenny; the latter coin, having a distinct name, would be the tenth part of a prince.” By this plan, the decimal system might be retained at the same time as the binary, to which retail dealers are so much accustomed; there would be a denomination for the tenth part of a sovereign, one also for the hundredth part, and one for the thousandth; these might soon be brought into requisition in bankers’ and merchants’ accounts; while the other coins would be fitted for those retail dealers who require smaller submultiples than ten.

In the ‘Companion to the British Almanac,’ for 1841, Professor de Morgan points out a simple and expeditious mode of converting sums of money into decimal fractions of a pound, or, in other words, expressing money decimally, instead of by the usual circumlocution of £, s., d. He then adverts to the possibility of so adjusting the coinage as to enable this decimal computation to be brought into use in the common affairs of life. The principle advocated is in many respects similar to that of Mr. Babbage; but the propriety of allowing time for one change to become established before another is introduced, is
insisted on more pointedly. Mr. de Morgan proposes the introduction of a new coin valued two shillings, to be called the “royal,” which is to be issued from the Mint and brought gradually into circulation, the half-crowns being melted up as fast as they come to the Bank or the Mint. By this means the first step would be made towards a decimal division of the pound sterling; and matters might be allowed to rest there for a few years, till the public became accustomed to the alteration. Then would be issued a copper or a silver or a mixed metal coin valued at two-pence halfpenny of present money, and which might perhaps be called a “groat”; persons would become accustomed to the half-crown, equal being equal to 23 of some particular coin. This great might, in the first instance, be deemed two-pence-halfpenny of present money, and ultimately as the tenth of two shillings, or 32d.; for, as Mr. de Morgan remarks, this alteration of four per cent. in the value of a copper coin is not important, since the daily fluctuation in the price of copper amount to much more. We should then have the tenth and the hundredth of a pound; but pence and halfpence might be left in circulation till persons were accustomed to the change. The thousandth of a pound would result from making a minute change in the size of the present farthing, since nine hundred and sixty farthings make a pound; so that we have then every farthing equal to one-thousandth of a great, ten groats equal to a royal, ten royals equal to a sovereign. It would be necessary to enact that five groats should be legal tender for one shilling, and ten groats for a royal; but Mr. de Morgan thinks this would produce no practical inconvenience. The advantages likely to accrue from such a change are thus enumerated, and would be performed by the same rules as in the arithmetic of whole numbers; an extended multiplication table would be a better interest table than any which has yet been constructed; the application of logarithms would be materially facilitated, and would become universal, as also that of the sliding rule; the number of good commercial computers would soon be many times greater than at present; all decimal tables, as those of compound interest, &c., would be popular tables, instead of being mathematical mysteries; and when the decimal coinage came to be completely established, the introduction of a decimal system of weights and measures would be very much facilitated, and its advantages might be very great.

Still more recently, this subject has been brought under the notice of the British Association for the Advancement of Science. At the meeting of the Association in June last, the Rev. G. Peacocke, Dean of Ely, communicated the Report of the Commissioners for the restoration of lost standards of weights and measures, and their proposal for the introduction of a decimal system. The imperial standards of weight and measure having been lost in the fire which destroyed the two houses of Parliament, a commission was appointed to report on the best means of restoring these standards. That portion of the Report which relates to weights and measures we need not consider here, further than to state that a “primary unit” of each kind is recommended to be retained, whatever be the other approximations towards a decimal system; the primary units being the pound sterling, the imperial pound, the yard, the acre, and the gallon. With respect to the coinage, the Commissioners, taking the pound (£) as the primary unit, proposed to introduce a coin of the value of two shillings (one-tenth of the pound); another, either silver or copper, of one-tenth of two shillings (or 2d. and a fraction), which might be called a cent, as being the hundredth of a pound sterling; and a third, called the millet, to consist of one-thousandth of a pound, and therefore a little smaller than the present farthing. For the proposed coin of two shillings, various names had been suggested, as “Victorine,” “rupee,” or “florin;” but being not much different from the value of some of the rupees in the East Indies, or the florin of the Continent. Under this new decimal scale, the shilling would be retained, and also the sixpence,—but the latter under another name better expressing its value under the new order of things.

It will be seen that the suggestions of Mr. Babbage, of Mr. de Morgan, and of the Commissioners, all point pretty much in one direction—all recommend a coin value two shillings of present money, whether called a “Prince,” a “Royal,” or a “Victorine;” all suggest another coin, one-tenth of this in value, and equivalent to rather less than two-pence halfpenny; and also the striking of “farthings” equivalent to one-thousandth of a pound. The opinion seems also to be pretty general that the binary divisions of the shilling and sixpence, &c., or of each other, should be retained. The nature of these propositions is such, that until persons engaged in keeping financial accounts become fully alive to the facility and expeditious operation of decimal arithmetic, mischief rather than good would result from making a change; since the small shopkeepers will never dream of the matter of the alteration. Old habits are unlearned with difficulty, even when the advantage of a change is pointed out; and hence the importance of making the advantage of such a change as this obvious to those who will first feel the benefit, viz., bankers and commercial men. If these classes are disposed to regard the change with approbation, half the difficulty would be removed.

The History of a Piece of Tape.—To trace the various processes by which a piece of tape passes through, and the various employments it affords, before it comes into the market, is a very curious and interesting occupation. Beginning with the first commercial operations:—The cotton used in the manufacture of tapes having been warehoused, we will say for instance, in Liverpool, is sold on account of the importer, and bought to the order of the manufacturer by cotton-brokers. It is conveyed by canal or packet-boat to Manchester, and when delivered at the works of the purchaser, is weighed, assorted, mixed, and spread, with a view to obtain equality in the staple. It is then taken to the lapping-machine to be opened and rendered flocculent; thence it is conveyed to the condenser, which consists of a powerful press to make the compact. It is next passed through the blowing-machine, by which the cotton is taken up and laid in a continuous fleece upon a roller, in order that it may be conveniently carried to the carding-engine, where to be made into a piece of the most equable texture possible; thence it is handed to the drawing-frame, where it is blended with the production of all the carding-engines connected with the particular set or system to which it belongs. It is then next passed through the shaving-frame, afterwards through the jack or rolling-frame, and then through the thrum- or spinning-frame, upon which it is made into yarn or twist. From the thrum, the yarn, if intended for warp, is forwarded to the winding-frame; but if intended for weft, to the reeler. Afterwards, that which is wound is delivered to the warper; that which is reeled, to the pin winder. The warper next operates upon it, passes it through the loom, rolls up the tape, and consigns it to the taker-in, who examines the fabric and transfers it to theoutter, who sends it to the bleacher. When bleached, it is handed to the stocker, who bale it and sends it to the young women; after which the maker-up forms the piece into parcels, containing the required quantity, and places them in a powerful press to make them compact. He next papers them, and sends them to the warehouse for sale.—J. G. C.
NEW ABBEY, OR ABBEY OF SWEET-HEART.

The picturesque ruins of the Abbey of Sweet-heart lie in the Stewartry of Kirkcudbright, upon the left bank of the Nith, about seven miles south of Dumfries. They consist of the church and part of the chapter-house, the only remains of the once magnificent and extensive building founded by Devorgille, one of the coheirresses of Alan, the last of the ancient lords of Galloway, wife of John Balliol, lord of Barnard Castle, and mother of John Balliol, king of Scotland, in the early part of the thirteenth century. Her husband died in 1265, when she caused his heart to be embalmed, and preserved in a highly ornamented box of ivory bound with enameled silver, which was set within the wall of the church near the high altar, from which circumstance the abbey obtained its name of Dolce Cor, or Sweet-heart.

The foundation was of the Cistertian order, and was liberally endowed with ten churches, the barony of Lochpatrick, and divers lands and other possessions, amounting in the whole to a revenue of £522. The first abbot was Henry, who died on his journey to Citeaux; his successor, Eric, was among the free barons who swore fealty to Edward I., on his undertaking the arbitration between the claims of Balliol and Bruce for the crown of Scotland. The number of the brethren is not exactly known, but in 1348 a charter appointing Robert, Master of Maxwell, and his heirs, to be hereditary bailies of the abbey, to take the said abbey under their protection, for which they were to receive lands, mill, and fisheries, feued at 177 marks 8 shillings and 8 pence Scots, has the signatures of the abbot and thirteen monks. The last abbot was Gilbert Brown, who sat in parliament when the Confession of Faith was adopted on August 17, 1560. He was an active controversialist on the Catholic side, and, as Dr. M'Crie says in his 'Life of Melville,' "a busy trafficker for Rome and Spain;" he had consequently the distinction of being specially named by the Commissioners of the Assembly when, in their list of grievances submitted to the King in 1596, they stated the "Jesuits and other excommunicated persons were entertained within the country;" orders were issued for his apprehension on this charge, but it was not till 1605 that he was taken, nor then without difficulty, as Calderwood states that the people attempted to rescue him. He was, however, treated with considerable indulgence, and after an imprison-
upon the whole, less understood than the pruning of number of leading shoots, the strength of the nutritious trees. The utility of pruning hard-wood trees is generally admitted by practical men. Although pruning in ordinary cases does not ultimately increase the bulk or weight of wood, yet trees which are early, judiciously, and annually pruned, will be improved in quality, increased in their useful dimensions and eventual value, and a greater number can be grown on a given space. Judicious and timely pruning and feeding, promoting the growth and value of by far the larger variety of hard-wood trees, and even of the coniferæ in exposed situations. Their value as timber is much deteriorated by numerous ramifications attracting and retarding a great proportion of the elaborated sap, which, if properly directed by judicious pruning, would go to form valuable timber in the main trunk of the tree.

In some situations the necessity of pruning may be in a great measure obviated by thick planting and timely thinning. These means are generally most effectual in producing straight and well-grown timber in every species. In such cases thinning early prevents the necessity of excessive pruning. Some are of opinion that much may be done in thick oak-woods without pruning, by carefully thinning out the worst trees, and leaving those best calculated to become fine timber; but when woods are thin, pruning and training scientifically are essential. Thick planting and early thinning are the nearest possible to the unassisted operation of natural causes towards the formation of tall, straight, and well-grown timber.

In order to produce the most beneficial effects the process of pruning should be begun early, and not carried to any large extent at once, but renewed every year as the tree advances, until it is brought to the most perfect form its nature will admit of. When trees in the plantation have produced three or four thriving two-years' growths, pruning should be commenced. At this period the knife is the most suitable instrument, and the principal means of operations is the cutting off selected branches more vigorous and over-luxuriant than the leader, gradually clearing the tower of the abbey, is still a fine lake for trout. The parish in which New Abbey is situated was an anciently named Kirkendar, but has since adopted the name of its greater ornament, and is now called the parish of New Abbey. It extends along the Nith to the Solway Frith; the parish is extensive, and the lower part is fertile and well cultivated, while the upper and by far the larger portion consists chiefly of rocky hills, mooses, and muirs. The air is considered fine and healthy, and the place is much visited in summer for the benefits to be derived therefrom, and from the use of goat's whey and sea-bathing. The parish kirk, built in 1731, stands on the south side of the abbey church, and is formed out of part of the ruins; "near it is a small gate," says Grose, "leading into the abbey, on which is a bell: this is of a curious style of architecture; on it are several defaced carvings in bas-relief, and a sculptured lion. The burial-ground lies to the east of the abbey church; in it are some ancient tombstones; on one a cross, with a large and broad sword on the sinister side of it."

In the parish, which has a population of about twelve hundred, besides the parochial school, there are two other schools with small endowments. The valley or hollow, in which New Abbey is situated, was probably considered more healthful than the wooded bottom occupied by the abbey and village beneath.

ON THE PROPER MANAGEMENT OF FOREST-TREES.

[From a Correspondent.]

Considering the means that have been afforded, it is truly astonishing to see with what neglect ninety-nine per cent of wood and hedge-row trees out of a hundred have been and still are suffered to remain. No branch of rural affairs, without exception, has made less progress or is upon the whole less understood than the pruning of trees. The name of its greater ornament, and is now called the parish of New Abbey. It extends along the Nith to the Solway Frith; the parish is extensive, and the lower part is fertile and well cultivated, while the upper and by far the larger portion consists chiefly of rocky hills, mooses, and muirs. The air is considered fine and healthy, and the place is much visited in summer for the benefits to be derived therefrom, and from the use of goat's whey and sea-bathing. The parish kirk, built in 1731, stands on the south side of the abbey church, and is formed out of part of the ruins; "near it is a small gate," says Grose, "leading into the abbey, on which is a bell: this is of a curious style of architecture; on it are several defaced carvings in bas-relief, and a sculptured lion. The burial-ground lies to the east of the abbey church; in it are some ancient tombstones; on one a cross, with a large and broad sword on the sinister side of it."

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out any interior blemish, and be trained to any reason-
able altitude according to the soil, subsoil, and situation
on which they grow; but if neglected, such is the prop-
sedomty of most sorts of what are called "round-headed
trees" in open spaces to run into branches, that without
due attention the foliage will become too voluminous
for the roots, and a check to lofiness and the formation
of useful timber will ensue. The only rule to attend
to is to keep the top to taper, preserving the leading
shoot clear and free from clefts and the bole free from
all the largest-rooted branches, leaving those only of
the smaller kind that are requisite for the health and
support of the tree, and clearing the tree from the
bottom of all the branches as it advances in age. But
the bole should be cleared very slowly at first when
the trees are young. Only keep the branches that are
left thereon small by often pruning, so as not to injure
the tree when it becomes timber. By the heads of
these trees being kept tapering when young, the rapidity
of the growth is greatly increased on account of the sap
being confined to the most useful points, and not allowed
to spread in support of large unnecessary branches. By
attending to these rules and the operation of pruning
being executed every year, the bole will be extended
to a great height, and at the end the grand object
attained, viz., the production of sound unblemished
timber.

The proportions which will be found most consistent
with full-sized trees are fifty feet of trunk to thirty-five
feet of head. It is of the utmost importance that trees
should have circumference of stem in suitable pro-
portion to their height. In young trees there should be
one inch of circumference for every fifteen inches of
height. If the circumference is proportionately greater,
so much the better. Trees should be examined every
year till they are fifteen inches in circumference; the
highest will then be fully eighteen feet.

Whenever dead branches are found on any tree, they
cannot be too soon removed; and even for plantations,
which when thickly planted are generally self-pruned,
will be improved by having all the dead wood pruned
off quite close. Dead branches being allowed to remain
on the bole only tend to produce moss, espe-
cially in damp situations; and their hurtful nature to
trees of all kinds is too well known to require any fur-
ther comment.

The greatest diversity of opinion seems to prevail
respecting the proper season for pruning trees; indeed
all different seasons have been mentioned as the most
proper by one writer or another. As we have the
testimony of authors that all of them have been put to
the test of experience and have been attended with
success, we may be tempted to conclude that provided
we use proper caution in pruning and do not cut very
large branches, it is not of very material consequence
what season we choose for the operation, and that the
smaller wounds caused by the gradual and careful
pruning above recommended will heal in a reasonable
time and without any great damage at any season of
the year. There is no doubt still much to learn re-
pecting the proper management of plantations and
hedge-row timber.

ON RIVERS, GEOGRAPHICALLY CON-
SIDERED.

In a few rivers the tide ascends to a great distance
from the sea. In the Amazonas it is perceptible in the
Narrow of Pausis near Obydos, a distance of nearly
five hundred miles from the mouth of the river, mea-
sured along its course. If we suppose that the tide in
this river advances at the rate at which it runs in the
Elbe between the North Sea and Hamburgh; namely,

nearly a mile in five minutes, the tide can only reach
the Narrow of Pausis in forty-two hours, or in a space
of time during which the direction of the tides has
changed seven times at its mouth. It is therefore
evident that the current of the Amazonas between the
Narrow of Pausis and the mouth of the river is not
nearly as strong as it is between the Elbe and the
North Sea. But even there the tide does not run with
the same velocity as at the mouth of the river; for
time and without any great damage at any season of
the year. There is no doubt still much to learn re-
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Elbe between the North Sea and Hamburgh; namely,
gable even within the mountains, in some parts for a considerable distance. The most extensive system of internal navigation is presented by those rivers which have a long course, and whose sources are situated at a comparatively small elevation above the sea. The Volga is navigable in the whole length of its course, and the Mississippi up to the Falls of St. Anthony, a distance of about eight hundred and fifty miles, measured along the river. Both these rivers, as already observed, have the greater part of their course between hills of small elevation, and they do not traverse a mountain-region.

The rivers of England supply the means of an extensive system of inland navigation, a circumstance partly due to their small fall, their sources being only a few hundred feet higher than their mouth, and partly to the abundant supply of water from rain, mists, and springs. Accordingly, if two rivulets unite, they generally form a small navigable river; and such as are not navigable become useful as feeders to canals. The navigation of most of the rivers of England has been much improved by artificial means.

In those countries in which the temperature for three or four months is under the freezing-point, the rivers during that time are covered with ice, and in this state they afford to the inhabitants the advantages which other countries derive from railways. Travelling and the transport of goods on the smooth ice of the rivers are much less expensive, and are performed in a shorter time than in summer in the ordinary way. This is the case on some of the rivers of New Brunswick and Lower Canada.

It has been observed that the outer borders of rivers are the most elevated parts which occur in some given places between their respective banks, though it is not always the case that the watershed is formed by mountain-ridges. Owing to such a disposition of the surface, the waters which are collected on or near the borders run to one or other of the two rivers. Up to the commencement of this century it was thought improbable, if not impossible, that two different river systems or basins could be united by a natural water communication. But it is now ascertained that a low tract of country or a deep depression of the surface may occur, by which a portion of the water of a river, after being diverted from its own channel, may join a river which otherwise is not connected with that river from which the water branches off. The instances in which this occurs are very few, and we shall therefore only enumerate those whose existence is beyond all doubt.

The branch of the Orinoco by which this natural water communication flow in the same direction or nearly so. But in South America two large rivers, the Orinoco and the Amazonas, are united in this way in a part of their extensive courses, where the Orinoco runs west and the Amazonas east. The branch of the Orinoco by which this natural water communication is effected is called Cassiquiare.

It is a kind of established rule that the whole course of a river should bear the same name, and that this name should be continued to that branch whose sources are farthest from the mouth. But practice is frequently at variance with this rule, and it may easily be accounted for. The inhabitants of a country prefer the name of that river which does not undergo any deflection of its course. At the confluence of the Mississippi and the Missouri, the latter is the larger river, and has had a course of above one thousand miles more than the former, but it does not deflect the course of the Mississippi by its junction, and the name of the last-mentioned river is preserved. The same occurs in South America as to the Amazonas and Madeira, where we find that the last-mentioned river changes the direction of its course to meet the Amazonas, whose name is preserved. In Europe the Rhine is joined by the Aar in Switzerland, above Laufenburg. The Aar is the larger river and brings down a greater volume of water, but the Rhine, where it is joined by it, continues its western course, and its name is preserved in some of its branches.

The extent of a few river basins is here given in...
round numbers, but they must only be considered as rough approximations:

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<th>River</th>
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Obligations of Governments to encourage Commerce.—All men ought to find on earth the things they stand in need of. In the primitive state of communion, they took them wherever they happened to meet with them, if another had not before appropriated them to his own use. The introduction of dominion that the amusement of the poor should be respected; and if their consent admiring her as the mother of peace and joy. — Hooker.

Desire of Distinction.—Excellence in all things is no longer attainable, when the standard of excellence has universally been raised so high. A youth soon discovers this: he is beaten in his classics at school; he is left behind in his science at college; he is eclipsed in his ambition by the down-right genius; he is awed into silence by the pedantry of the dinner table: his vanity is piqmed; he does not allow himself to reflect, till he finds out the true solution of the problem, in his own idleness or desultory reading, or perhaps in the thoughtless ambition that would grasp at all knowledge when unable to retain a fraction; he therefore settles down into the determination, "I will be distinguished in something," and standing six feet in his shoes, and blessed with a muscular arm, he forthwith speculates on rivalry with Tom and Tim; if the walls are cold on the occurrence of a southerly wind, they will act as refrigeratories, and occasion a precipitation of moisture from the humid warm air. The thin walls of wood, on the contrary, conform more to the picturesque. Even the most splendid of the palaces of the sultan is of the same destructible material. The preference is given to wood by the Turks, not chiefly on account of economy, but on the consideration that it is scarcely a shade better; drunkenness, debauchery, and licentiousness are common alike to all, and exhibited too in their grossest and most revolting forms. Some coarse and foolish people are found to uphold them under the sophistical pretence, that the amusements of the poor should be respected; and if these amusements are legitimate and rational, most undoubtedly they ought not only to be respected, but liberally promoted. But we have seen the very men who thus court popularity, by pandering to the worst passions of the poor, in the sporting papers of the day, think with disgust from the contumely of this brutish scenes which they attend to report, and empty their pockets most cautiously of watch and purse before they elow their way among the ruffians whose prowess they celebrate! The young that may be assured that he cannot any longer do the things that he has always done, if the sitting-rooms without pollution and eventual infamy, or even avow an accustomed interest in them without endangering his welcome in every well-ordercd family. 'Life in London' is not yet, we are happy to say, recognized as the life of London's educated circles. — Guide to Service. — The Clerk.

Turkish Houses.—The Turkish houses in Constantinople, as it is well known, are commonly of wood. The best of them, of the dimensions, daily pasted, are to the eye, and of all the rooms, however poor, are, from their few, unalike, a picture. Even the most splendid of the palaces of the sultan is of the same destructible material. The preference is given to wood by the Turks, not chiefly on account of economy, but on the persuasion that it is more genuine than stone, and of the purpose in which they are constructed. The idea of the unwholesomeness of stone buildings is not perhaps without foundation in such a climate. The stone houses in Galata, built by the Genoese, with walls of extraordinary thickness, are of bad repute. Unless the rooms are kept warm in winter, they must be damp in the spring and early summer. In winter chief] by a charcoal-fire, contained in the open mangal and the Ionian Islands.
A DAY AT A BOOKBINDER'S.

It is a necessary consequence of the connexion existing between different branches of manufacture, that no one of them can receive any notable increase or advancement without benefiting many of the others. Thus, the spur which was given ten or a dozen years ago to popular reading by the establishment of works issued at a small weekly price, and many of them illustrated by wood-engravings, has been the means of inducing changes and eliciting improvements in nearly all the arts connected with publishing:—wood-engraving, paper-making, printing, bookbinding—all have been affected by a moving-power which at first sight might appear a trivial one. Some of the works now published at a penny or three-halfpence weekly can vie with the costly works of bygone years in illustrations, paper, and printing; and those persons who were schoolboys in the days when schoolboys were whipped through 'Vyse's New London Spelling-book,' will not fail to see how rapidly such books are assuming the neat gilt-lettered cloth covers of modern times in place of the nankeen 'roan' of past years.

In one of our early volumes a sketch, under the title of 'The Commercial History of a Penny Magazine,' was given of wood-engraving, paper-making, type-founding, stereotyping, and printing, sufficient to convey a popular notion of those departments of 'bookmaking,' but the subject of Bookbinding was touched upon so slightly as to leave ample room for the present article. The mechanical and social economy of a large bookbinding establishment at the present day are of much interest; and we have been favoured by Messrs. Westleys and Clark with the requisite facilities for presenting the details which will now occupy our attention.

Any one who knows London intimately is aware that many of our large factories are so hemmed in on all sides by houses as to be scarcely visible externally. Thus, the case with the building now under our notice. It is a large pile, built expressly for its present purpose, and presenting much the appearance of a cotton-factory; yet we can scarcely catch a glimpse of it till nearly close to its walls. To say that it is situated in 'Shoemaker Row' will not perhaps convey a very precise idea of its locality to the mass of readers; and we must therefore be content with saying that it has Ludgate Hill a little on the north, Doctors' Commons a little on the east, and Apothecaries' Hall a little on the west. The building is six stories or floors in height, and has an extensive range of windows from north to south, with an entrance in the middle. Into this entrance we will suppose the reader to accompany us.

Each floor of the building is in general appropriated to one class of operations, under the superintendence of a foreman, who is responsible for that department. A winding quadrangular staircase extends up the centre of the building from bottom to top, with landing-places, at which are several doors leading to the workshops. The basement story consists of many rooms occupied as warehouses, or for processes wherein heavy machines are employed. Thus, one room is the 'board warehouse,' where the mill-board, purchased from the stationer in sheets of various sizes and thickness, is deposited in classified recesses till wanted. Another is the 'cloth-warehouse,' where the cotton-cloth, now so extensively used for covering books, is kept and cut to sizes. Near this is the 'embossing warehouse,' filled with pieces of leather or cloth which have received some of those ornamental devices to be described hereafter. One room, which we will call the 'cloth-cylinder room,' contains two machines for imparting to cloth the diamond or granulated or speckled appearance usually presented by books in cloth boards; an appearance which nearly hides the
rectangular interlacing of the warp and weft threads. The ‘embossing shops,’ on the same range, contain three powerful machines for giving to the flat covers of books those beautiful devices which now so often distinguish them; if the book be a Bible, we have an emblematical device of a religious character; if it be a ‘Shaksperian,’ we have something pertaining to the great dramatist; if it be a lady’s album or portfolio, a letter-case or blotting-book, we have a device of a graceful and ornamental character. This is an approach towards what may perhaps be termed a ‘principle’ in bookbinding, viz. that the subject of a book may be known from its cover; a principle which seems to have much to recommend it.

On ascending to the ground-floor, or that which is nearly on a level with the street, the hum of voices tells us that a numerous body of workpeople of both sexes is here employed. In the counting-house of the principals is one of those simple but valuable expedients for saving time, now so much employed in large factories; we mean a series of ‘speaking-tubes.’ Tubes pass from this room to the counting-house or other range of the factory. All these are associated with these are a range of bell-wires; a bell is first rung, which draws the attention of the foreman to his end of the tube; and a message being then whispered or spoken through the tube, he hears it readily, and gives the necessary reply. All the tubes are inscribed with the names of the department to which they belong.

The main portion of this floor is occupied by the ‘boarding-shop,’ a technical name for the shop wherein all the operations are conducted for binding books in cloth boards, the most prevalent style at the present day. In one part of this room females are engaged in folding the sheets, gathering them into groups, sewing together the sheets of a book, &c.; while in other parts are men pursuing the subsequent operations of gluing, pasting, cutting, hammering, pressing, &c., by which the book is brought to a finished state. This is a very busy scene, and one presenting much variety, from the distinct nature of the processes carried on. In many branches of manufacture it is found convenient to locate the workmen according to the kind of book required; but in bookbinding on a large scale it is found desirable to classify with respect rather to the style in which the book is to be bound, than to the nature of each individual process. Hence nearly all the workpeople required for binding an extensive order of books in boards are here congregated on one floor. The folding-tables for the folders, the presses for the workmen, are the scenes of many remarkable and ingenious processes, of which we shall speak more hereafter.

The next range (which, if we reckon the basement as the commencement, must be called the third) exhibits an example of the classification just alluded to. This is called the ‘roan-shop,’ or the ‘sheep-shop,’ in allusion to the preparation of those books which are covered with roan, or sheep-leather. Most readers are perhaps aware that books bound in ‘sheep’ are less expensive than those bound in ‘calf’; the leather itself is less costly, and the general style of workmanship less elegant. The men who are accustomed to one sort of binding are generally employed upon that kind; and hence the preparation of roan-bound books in a workshop different both from that above described and from that devoted to more elegant work. This range is, however, not strictly confined to roan-bound books, since ‘school-books,’ whether bound in cloth or other material, are prepared here. The large room exhibits nearly similar features to that below stairs; females, in one department, are forwarding the earlier operations; and men, in another department, are finishing the volumes. Our frontispiece represents the appearance of this room.

Another room on the same range, known in the factory as the ‘Pinnock’ room, affords us a curious insight into the amount of sale which popular works sometimes command. This room is appropriated mainly to the sewing and covering of the little ninemonth books called ‘Pinnock’s Catechisms.’ Of these small productions the sale is so large and so uninterrupted, that the processes of sewing and covering them proceed continuously. The numbers sold must be enormous; and indeed a glance through the operations of a range of the factory shows that such school-books as are so fortunate as to obtain a ‘name’ command an extent of sale scarcely equalled by any other kind of literary productions, with the exception of Bibles and Prayers. ‘Goldsmith’s England,’ ‘Mangiall’s Questions,’ ‘Carpenter’s Spelling,’ and other school-books, were piled in such heaps and groups in various stages of preparation as to invite a pretty clear view of the extent of the demand. Wherefore, even these books may have received from time to time as literary productions, or may be susceptible of receiving hereafter, is no part of the present subject; but externally they have marched with the march of the times, and have yielded to the binding reforms of ‘embossed-roan’ and ‘cloth lettering.’

The fourth range of the factory is occupied by the ‘extra’ workmen; that is, those who are employed on the finer kinds of binding, such as Bibles and Prayers, gilt-edged books generally, and books exhibiting all the costly and elaborate varieties of ‘Russia,’ ‘Morocco,’ and ‘Calf’ binding. One shop, called the ‘extra-forwarding shop,’ is occupied by the folders, pressers, sewers in clothboards, the ‘extra-finishing shop’ sufficiently explains itself.

In the two upper floors of the factory are numerous rooms more or less subsidiary to those below stairs. One or two are ‘blocking-shops,’ for lettering and ornamenting the covers of books; another is occupied by the men who make cloth-cases for books; in another, the leather is kept, as procured from the leather-dresser, and cut to the required sizes. Another is the ‘Annual’ shop, in which the Annuals are bound at the particular period of the year when they are wanted. One of the rooms is termed the ‘Caoutchouc-shop,’ as being devoted wholly to those books in caoutchouc or Indian-rubber binding; and there are a few others, which are used, or not, according as the amount of business fluctuates at different seasons.

Among several indications of a well-arranged factory, we noticed one which is always pleasing wherever observed. Many of the superintendents and workpeople are said to have been old standards. The whole is in harmony with the growth of the factory, and to have shared with the proprietors the progress and fluctuation to which all manufactures are subject. This is a feature which we have more than once had occasion to notice in reference to large factories, and is one of considerable importance to the well-being of both the employers and the employed.

Having thus glanced at what we may term the factory-economy of the establishment, let us next endeavour to follow the routine of processes, so far as to give the reader some idea of how a book is built up after it leaves the hands of the printer. We shall for this purpose classify the various operations in three stages, according as the book is putting-up a book; 2nd, to covering a book; and 3rd, to decorating a book. A bookbinder would probably object to this
mode of classification; but we think it will meet the
wants of the reader better than a more technical mode
of arrangement.

1st. Making-up a book. It must be obvious to all
who reflect that a book is printed in large sheets that
these sheets must be separately folded and then con-
ected together, before they can assume the form of a
book. If we open, without cutting, a number of the
'Penny Magazine,' or of Chamber's Edinburgh
Journal, we see that the eight printed pages are so
arranged, as to form, in proper order, when the sheet
is folded in a certain manner; and if, as in the 'Mirror,'
or 'Chamber's Information for the People,' there are
sixteen pages in a number, the arrangement of these
pages appears singularly confused when the opened
sheet is inspected; but here, as in the former case, the
pages are arranged solely with reference to the order
of arrangement, especially in the finer kinds of fold-
ing, as the sheet is folded so as to make the top and
bottom lines of the print range, without reference to
the edge of the paper. The sheet is placed with
the signature towards the left hand of the folder, on
the under surface; and the foldings are more or less
numerous according as the book is folio, quarto,
12mo., 16mo., 18mo., 24mo., 32mo., &c., terms
which relate to the number of printed pages in one
sheet.

Supposing a group of signature A to be thus folded,
another of signature B, and others, to the extent re-
quired for the volume, these will have to be 'gathered'
into volumes at the next process. This gathering is
simply breaking up the sheet into existing groups
and re-arranging the same sheets in the order neces-
sary for the volume. Instead, for instance, of having
twenty copies of one sheet, such as that with the sig-
nature A, one of A is taken, then one of B, then one
of C, and so on, until there are as many groups as
volumes, and each group containing the sheets for one
volume. This 'gathering' is in most cases done by
the printer before the sheets pass into the hands of
the bookbinder.

The 'collater,' now takes the group of sheets in
hand and examines them to see that they occur in
proper order, that no duplicates occur, that no sheet is
wanting, that the folding is correct, &c. This is a pro-
cess in which much expertness is shown. The sheet
is bent at one corner, and the sheets allowed to spring
back successively, leaving to the eye just sufficient
time to catch the signature at the bottom of the first
page of each. If these signatures occur regularly,
according to the letters A, B, C, &c., or the figures
1, 2, 3, &c., or any prescribed combination of both,
before. Each successive sheet is laid flat on the bed of the sewing-press, with the back edge in contact with the side of the machine. The middle sheet is then fastened to the strings by passing a threaded needle back and forth through the central fold of the sheet; each thread, after passing from the inside to the out, being made to loop or twist round one of the strings before entering the sheet again. As soon as one sheet is fastened to all the strings, another is laid down on it, and fastened in a similar manner. A curious kind of stitch, called a 'kettle-stitch,' is made near the top and bottom of the book, as a means of allowing the thread to pass on from one sheet to another. Nonprofessional readers may be sorely puzzled to know what 'kettle-stitch' means, but we can only say that it is supposed by some to be a corruption of 'catch' or 'kotch' stitch, others refer it to 'chain' stitch. Those who would attempt to trace the etymology of technical terms and phrases would soon find themselves in a sea of mystery both wide and deep.

The operation of sewing is conducted with great rapidity, since a female can sew two or three thousand sheets a day. The variations of the process occur according to the size of the book and the style of binding. Thus, the number of strings may be only three, or may amount to eight or ten; or instead of strings, strips of vellum or of parchment are sometimes used. In some cases the needle passes through eight thicknesses of paper, in others six, in others four, in others two; according to the size of the sheet, the number of pages in it, and the mode in which the pages are arranged. It is a fortunate circumstance, considering the very limited number of employments for females in this country, that there are several departments of bookbinding within the scope of their ability. The greater part of that which has hitherto engaged our attention is intrusted to females; and in a large bookbinding establishment employment is thus afforded to a considerable number. This firm, for instance, in a busy season, give employment to about 200 females, whose weekly earnings average from 10 to 18 shillings; and where a supervision, at once kind and judicious, is observed by the principals, an honourable subsistence is thus afforded to those who might have other resources to fly to.

While speaking of making up a book, we must remark that caoutchouc or India-rubber binding requires no sewing. The sheet is cut into separate leaves, and these leaves are retained solely by a cement of caoutchouc applied to their hinder edges. The leaves are allowed to assume a round contour at the back-edge by placing them in a kind of mould or gaugeshaped for the purpose; they are then rasped, to give a slight roughness for retaining the caoutchouc afterwards applied. A flexibility is produced by this kind of binding, greater than can be presented by a sewed book; while at the same time the caoutchouc cement is so resistive as to bind every single leaf firmly. This new mode of binding was introduced a few years ago, and is valuable for many kinds of volumes.

2nd. Covering a Book. We have now made up the sheets into the form of a book, and have connected them together. Whether the volume is in elegant 'calf-extra' or 'Russia-extra,' or whether it is a rebound school-book, or a 'boarded' book, the sheets are brought together in some such mode as above have attempted to describe above. Here then we shall commence the second of the three sections into which we have thought it proper to classify the operations. The 'cover' of a book, in bookbinders' phraseology, is a piece of leather or of cloth which envelopes the millboard; but the reader of a book, when he speaks of its cover, gives the term a much more extensive application. We must therefore at once explain that the leather or cloth is called the cover, the stiffening within is the board, and both taken collectively the case.

When the book is taken from the sewing-press, an inch or two of each string is left hanging to it; these are afterwards either scraped so thin as to be but little conspicuous, or are employed for fastening the book to its case. The back of the book—that is, the assembled back-edges of all the sheets—is glued, to increase the bond by which they are held together. When the book has gone through one or two other minor processes, that one succeeds which is perhaps as remarkable as anything displayed in bookbinding; viz. rounding the back and following the front. Most persons can understand the production of a square back and edge to a book; but the graceful convexity of the one and concavity of the other, in most books bound in the modern style, are as curious in the mode of production as they are pleasing in appearance. In the process of 'backing,' by which this effect is produced, the book is laid on a bench, held or pressed by the left hand of the workman, as shown in the annexed cut, and hammered near the back edge, with such a peculiar movement of the left hand as causes the back to become rounded while the hammering proceeds. The effect is so instantaneous that a looker-on scarcely knows how or when it is produced. The state of the back is such as to enable the sheets to yield to the rounding action of the hammer, being coated with glue not yet dried; and the subsequent drying of the glue retains the sheets permanently in the position which they thus acquire.

It may perhaps have occurred to many a reader, that, as the board of a book is frequently of considerable thickness, it is likely to project beyond the back and to form a stiff and inconvenient hinge. This is prevented by a very simple contrivance, adopted at the same time when the book is 'backed.' It is placed between two pieces of plank called 'backing-boards,' or the hinder edges of which are placed precisely where the two hinges of the book are to come. The book with the boards thus placed, is then squeezed tightly in a press, with the back edge uppermost; and the back being thus again hammered in a round form, a portion of edge projects over the boards, so as to form a kind
of groove into which the millboard may afterwards conveniently be adjusted.

The reader may bear in mind that the edges of the book must now be left rough and uneven; but the time has now come when these edges must be brought to the level and smooth surface which adds so much to the beauty of a book. There are a few minor processes carried on about this time; but the plan of our article requires that we should notice only those of most prominent importance. In former times the edges were cut in a most clumsy and rude manner by means of shears, one blade being fixed to a bench, and the other being moved by the right hand of the workman, while his left hand held the book, and the leaves were cut a few at a time. The cutting of the edges was partly effected by this method, and partly by drawing the edge of a sharp knife along the leaves, guided by the edge of a board. The 'cutting-press' of the present day is however much more effective in this respect. The book, after being properly adjusted between two boards, is screwed in a press, with one of the ends projecting a little above the level of the bench. The ends of all the leaves are then cut off while in this position, by means of an instrument called a 'gauge,' the cutting edge of which, in its mode of action, is midway between that of a pointed knife and a plane-iron. The edges are all cut to a perfect level; and the book being reversed, the other end is similarly treated. But by far the most remarkable part of the process is that by which the concave front edge is brought to such a regular curve. Most persons who have thought of the matter at all may have conceived that this concavity is produced by scooping out a portion with a gouge; and indeed the circumstance of the concavity of the front edge being just the same in degree as the convexity of the back has given rise to many sage conjectures wholly wide of the truth. The glue with which the back of the book had previously been coated is so far softened as to suffer the band and the back edges of the sheets to yield to pressure; and this is followed by an operation which makes a stranger fear that the round of the back is destroyed for ever. The workman takes the book in his hand, front edge uppermost, and strikes the back forcibly against the bench; thus transforming the round back into a square one. Then, using a knife, he keeps the sheets in this position, he fixes the book in the cutting-press, and cuts the front edge in precisely the same way as the top and bottom; thus making all the edges perfectly square, and all the leaves perfectly equal in size. The most remarkable part of the operation then succeeds; for immediately on removing the temporary fastenings from the book, the whole of the leaves spring back to their former position, that is, convex at the back edge; and the slightest consideration of the nature of curvature will make it manifest that, as all the leaves are made perfectly equal in the cutting-press, a convexity at one edge must be accompanied by an equal concavity at the other. Hence is produced the hollow or 'gutter' of the front edge.

In this, as in other parts of bookbinding, the process is modified to suit different circumstances. Books in boards are either not cut at all at the edges, or only partially cut; while bound books are carefully cut at top, bottom, and front edges.

We next turn our attention to the boards, which are permanently attached to the book in different stages of its progress towards completion, according to the nature of the binding. Millboard, the stiff substance of which the sides of books are formed, is a thick paste-board composed of many parallel layers, glued or pasted together, and pressed in a mill to make them dense and smooth. The sheets are of various sizes and thicknesses, according to the size of book for which they are required; and the bookbinder sometimes glues two together, to produce a board of double thickness. From the large sheets, the smaller pieces are cut to form the sides of the books. In the first place, a pattern-piece, or size-pattern, is prepared, having the exact size and form of the boards to be cut. The cutting-machine is then adjusted to these dimensions, by causing an edged instrument, analogous to a scissor-blade, to work at a certain distance from a groove or raised ledge, against which the board is placed. The actual cutting is effected, as here represented, on the same principle as by a pair of shears; but the arrangement of the machine enables the pieces to be cut with perfect accuracy, both as to size and to rectangular form.

The boards are cut by the same machine, whatever may be the department of the factory where they are to be used; but the period of adjusting them to the book depends on circumstances which we may now explain. If a book is put into 'cloth boards,' or is 'bound in cloth,' the cloth cover is attached to the boards before the latter are attached to the book; but if the book is 'bound' or 'half-bound' in leather, the boards are first attached to the book by means of the strings, and the leather cover is pasted on afterwards. In the one instance the cloth is cut from the rolls to the required size in the cloth-warehouse, and handed over to the 'cloth-case maker;' in the other, the leather is cut from the skins in the leather-warehouse, and consigned either to the binders or to the embossers.

A boarded book is attached to its covers almost entirely by the boards being pasted to the blank leaves, or 'end-papers,' placed by the binder at the beginning and end of the book. The 'cloth case' is first prepared by pasting the cloth upon the boards, placed sufficiently wide apart to allow for the thickness of the book; and the case, thus made, is attached to the book by the back of the book being covered with stout linen and afterwards fastened to the case; the end-papers are then glued to the boards.

In a bound book, however, the process is different, and more carefully conducted. The boards being adjusted to the proper sizes, the back of the book rounded, the edges cut, holes made through the boards opposite
to the strings, and the strings of the proper length, the boards are fastened to the book by passing the ends of the strings through the holes or "strings" in the backs of some books. The boards are fastened to the book by passing the ends of the strings through the holes or "strings" in the backs of some books.  

First, then, from the edges. The majority of cut-paper or a doubled layer of paper or cloth between the leather and the back of the sheets: this layer helps to strengthen the book, and, at the same time, admits of the back being made close or hollow, according as the two layers of paper are or are not made to adhere together. If we suppose a hollow cylinder of paper to be pressed flat, and one side pasted to the back edge of the sheets, while the leather cover is pasted to the other side, we shall have some idea of the nature of a 'hollow back.'

When a book, attached to its boards by means of the bands, is ready to receive the leather covering, the leather is cut to the required size, allowing about half an inch all round for paring and turning in. The edge is pared or cut by a tool called a 'gutter.' The gutter is a keen knife, capable of producing a smooth surface, so equable and uniform as to render the impression of the devices done partly before and partly after the leather is attached to the book, as we shall explain further on. But the mode of pasting the cover of a book is still a matter of importance. The book is laid smooth with the face downwards, and the back surface well coated with paste. The workman then takes the book in his hands, lays the back evenly in the middle of the leather, and draws and smooths and works the latter until it adheres closely to the back and boards of the book.

This is a process of very great nicety; for not only must the leather and the back surface be closely covered, but the overlapping edges, the turning-in, the corners, &c., must all be finished with great exactness, or the book will be at once spoiled. It is one of those operations, so frequent in manufactures, wherein success depends on a nicety of manipulation, as incapable of being described as of being imitated without long and careful practice.

There is one little appendage which we may notice here, viz. the head-band. Every one is familiar with the fact that his Bible has a little band or edging of silk at the top edge, where the paper joins the cover. This head-band is partly for service and partly for appearance; it helps to sustain the leather at the back of the book at the same level as the boards; and it gives a neat finish where slight imperfections might otherwise be visible. The better kinds of head-bands are formed of little strips of vellum or pasteboard, with coloured silk twisted over and around them in the process of fixing them to the book; while the commoner kinds consist of a cord inserted in a doubled piece of coloured silk or cotton-cloth. We may also here mention the 'raised bands' which are sometimes used for ornament in the better kinds of books; they consist of little strips of leather or cord pasted across the back of the book before it is covered, and afterwards stamped and gilt so as to contribute to the beauty of the volume.

3rd. Decorating a Book.—We have glanced through the more prominent operations by which the book is made to assume its compact, convenient, and durable form; omitting mention of many slighter manipulations which would neither suit our limits nor be intelligible to general readers. There is, however, a wide difference between a book thus prepared and as given in a finished state from the hands of the bookbinder. The edges of the leaves are cut; but they are white, unless they are covered with cloth or with leather; but neither cloth nor leather is embossed or stamped, or gilt or lettered. As these adornments are subsidiary to the formation of the book itself, we have thought it better to group them by themselves, whether they are done before or after the cover is laid on the book.

First, then, from the edges. The majority of cut-paper or a doubled layer of paper or cloth between the leather and the back of the sheets: this layer helps to strengthen the book, and, at the same time, admits of the back being made close or hollow, according as the two layers of paper are or are not made to adhere together. If we suppose a hollow cylinder of paper to be pressed flat, and one side pasted to the back edge of the sheets, while the leather cover is pasted to the other side, we shall have some idea of the nature of a 'hollow back.'

When a book, attached to its boards by means of the bands, is ready to receive the leather covering, the leather is cut to the required size, allowing about half an inch all round for paring and turning in. The edge is pared or cut by a tool called a 'gutter.' The gutter is a keen knife, capable of producing a smooth surface, so equable and uniform as to render the impression of the devices done partly before and partly after the leather is attached to the book, as we shall explain further on. But the mode of pasting the cover of a book is still a matter of importance. The book is laid smooth with the face downwards, and the back surface well coated with paste. The workman then takes the book in his hands, lays the back evenly in the middle of the leather, and draws and smooths and works the latter until it adheres closely to the back and boards of the book.

This is a process of very great nicety; for not only must the leather and the back surface be closely covered, but the overlapping edges, the turning-in, the corners, &c., must all be finished with great exactness, or the book will be at once spoiled. It is one of those operations, so frequent in manufactures, wherein success depends on a nicety of manipulation, as incapable of being described as of being imitated without long and careful practice.

There is one little appendage which we may notice here, viz. the head-band. Every one is familiar with the fact that his Bible has a little band or edging of silk at the top edge, where the paper joins the cover. This head-band is partly for service and partly for appearance; it helps to sustain the leather at the back of the book at the same level as the boards; and it gives a neat finish where slight imperfections might otherwise be visible. The better kinds of head-bands are formed of little strips of vellum or pasteboard, with coloured silk twisted over and around them in the process of fixing them to the book; while the commoner kinds consist of a cord inserted in a doubled piece of coloured silk or cotton-cloth. We may also here mention the 'raised bands' which are sometimes used for ornament in the better kinds of books; they consist of little strips of leather or cord pasted across the back of the book before it is covered, and afterwards stamped and gilt so as to contribute to the beauty of the volume.

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camel-hair brush, and laid on the book-edge: This is done to all the three edges in succession; the book being turned round in the press to bring the successive edges uppermost. After the lapse of a very few minutes, it is removed and the succeeding edges are dressed and laid for polishing, a process which would seem calculated rather to rub off every atom of gold than to polish it. The workman holds in his two hands a long-handled burnisher, at the lower end of which is fixed a very smooth straight-edged piece of hard stone; this he places on the gilt surface, and with his left elbow resting on the workman's armpit, the handle of the burnisher resting on his right shoulder, he rubs the gold with great force at right angles to the direction of the leaves. No gold is rubbed off, but the whole is brought to a high degree of polish; the compactness of the leaves being such as to allow no chalk-colour or egg or gold to penetrate between them. If the burnisher were worked in the direction of the leaves, the polish would not be so high. The boards of the book are during these processes turned back as far as possible; and when the gilding is completed, paper is wrapped round the gilt edges, to prevent the gold from being soiled in the subsequent finishing of the book.

The covers of books are decorated in a greater variety of ways than the edges. Rotted school books are sometimes marbled outside; a process which bears some resemblance to the sprinkling of the edges. A liquid composition of copperas, potash, water, and any common colouring substance, such as umber, is made. The books are opened, and hung over two bars, so that the boards may be nearly horizontal, and the leaves hang vertically downwards. This is done on a surface placed in the same way as before explained, so as to cover the back and sides of the book; the spots or splashes being larger or smaller, according to the mode in which the brush is handled.

A mode of improving the appearance of Morocco leather for the covers of books is not a little striking. Whoever compares the impression left by a piece of Morocco on the palm of his right hand, by means of a strap passing over the hand, a large flat piece of cork. Then, doubling one portion of the leather over another, so as to bring two surfaces into contact, he gently rubs the upper fold of leather to and fro with the piece of cork; varying the extent and position of the doubling, and the direction of rubbing, so as to let every part of the surface be rubbed against some other part. The effect is very marked; for not only are all the wrinkles removed, but they are replaced by a kind of granulated surface, consisting of a uniform series of minute raised dots, which when the leather has been allowed to dry, it retains this texture permanently, and is then applied to the covering of books.

The cotton-cloth with which so large a number of new books are now covered has an ornamental character given to it in three different ways, either before or after it is applied to the books. One mode is the impressing, all over the cloth, of a small and uniform pattern calculated to hide the barrenness and stiffness of the threads in the cloth. If the reader has an opportunity of inspecting the backs of many cloth-bound books, he will see that there are a great variety of patterns thus given to the cloth. The process is as follows:—In the basement story of the factory which has been engaging our attention, are two machines for preparing the cloth, each of which consists of two cylinders rotating in contact by means of the usual machinery, as here represented. The cylinders are engraved with the
to the boards; but the action of the machines and the nature of the device are the same in either case. The large embossing-press here represented, with its powerful horizontal wheel, its enormous screw, and the ingenious arrangement for heating the lower bed, is perhaps the most note-worthy machine in the factory.

When we compare a cloth-bound book, or the cheap embossed-roan Bibles now so much used, with an elegant morocco or russia-bound book, we see that the ornamental devices are raised above the common surface in the former case, and levelled below it in the latter. Hence a very different system of working is required. The name of blocking is given to the operation whereby the depressed device is given. This is either effected by a number of punches and other small tools used by hand, or by means of a small blocking-press. In the 'extra-finishing' shop, a name given to the shop where the higher class of books receive their ornamental devices, are several tripods or standing frames, which act as gas-stoves. A jet of gas is so placed as to heat a central compartment, into or against which the tools are placed, whether for lettering or ornamenting, whereby the blocking, or rather 'tooling,' is effected. Sometimes the depressed device is not coated with gold, in which case it is called 'blind-tooling;' in others, gold is laid on the book, and then stamped down with the heated tool. The workman has a vast number of tools, such as rounds, squares, points, scrolls, diamonds, lines, letters, &c., the combination of which, according to the taste which he is enabled to display, produces a pattern. The book is laid on a bench, with its back or sides uppermost, according to the part under operation, and the workman presses the heated tools down on the surface, leaving a device which is at once depressed and polished. In large or elaborate devices he has a paper pattern for his guidance.

When the device is to be a gilt one, the leather requires certain preparatory processes to fit it to retain the gold. It is first coated with size, then two or three times with white of egg, and lastly slightly touched with a piece of oiled cotton at the time the gold is laid on. The gold is laid on in slips of greater or lesser size according to the pattern; and the heated tools are immediately set on it above the gold is made to adhere permanently to the leather. The loose or superfluous gold is then wiped off with a rag,—which rag, we may remark, becomes an article of no small value in the course of time.

All that we have here said of ornamental devices applies equally to the lettering of a book. Where, however, it may be done conveniently, the punches or small devices, instead of being fixed in handles and used singly, are fixed, by means of glue and cloth, to a metallic plate, and thus impressed on the book at one blow by a press. This is then called 'blocking.' In the 'blocking-shop' are drawers and boxes filled with various small devices in brass, which the workman combines according to his taste, and fixes to a flat block or plate. The plate is attached to the upper bed of the press, heated by means of gas within; and the case of the book being introduced beneath, the block is let down on it, and imprints the device, whether it be gilt or 'blind.' Where a fillet, or line, or running sprig forms part of the ornament on the back, sides, or edge of a book, it is frequently done by a wheel or 'roll' in the manner here represented. The edge or periphery of the wheel has the device in relief, and this, being wheeled along carefully over the surface of the book, leaves a corresponding depression.

Such are the principal modes by which a book is decorated. We have been able merely to give a type or general representation of each, and must necessarily pass over minute shades of operation. The costly bindings in velvet and silk, the gold and silver clasps of expensive Bibles, and all the niceties which the connoisseur in bookbinding regards with such an admiring eye, we must pass over in silence.

It remains only for us to acknowledge the courtesy of Messrs. Westleys and Clark, which has enabled us to give this brief sketch; and we cannot conclude without again bearing testimony to the excellent moral effects that the manner in which their establishment is conducted produces upon the persons of both sexes who are in their employ.
FROISSART AND HIS CHRONICLE.
No. VII.
EDWARD THE THIRD AND THE COUNTESS OF SALISBURY.

Many of our readers will no doubt be aware that an interesting tradition exists respecting the origin of the ancient and illustrious Order of the Garter. At one of the splendid feasts given by Edward III., it is said the Countess of Salisbury accidentally dropped her garter, which some of the courtiers seeing, smiled. The king, noticing both the circumstance and the silent comment made upon it, said to them, "Honi soit qui mal y pense"—Evil be to him that evil thinks. Such is the tradition; and the motto of the Order to this day consists of the phrase said to have been thus made memorable. Not only does the peculiar character of the words point to some such romantic cause, but the tradition itself, or at least so much of it as attributes the origin of the Order to the fair sex, is as old as the reign of Henry VI. Why then should we doubt its truth? simply, we believe, because it is so romantic and interesting. It is evident that many of our grave semi-historians invariably act upon the principle of doubting every story that comes thus recommended; and the absurdities they in consequence run into to explain anew what has already been sufficiently explained, are most amusing. Thus various writers, whilst rejecting this story, account for the motto by saying Edward intended the phrase to apply to all cavillers against the French expedition! Later writers, however, appear to be returning to that view of the case which is at once most agreeable to common sense and to poetry. But it is curious to see how little stress has yet been laid upon an incident in the previous lives of that same king and countess, which in the highest degree supports, enhances, and illustrates the story.

During the early years of the reign the English and
Scotch were engaged in continual hostilities; and the two kings, Edward and David, were at a certain period with the armies on the border. During the manoeuvres, Edward found no difficulty in his way to the castle of Wark, belonging to the Earl of Salisbury, then a prisoner in Paris. His countess, however, fully supplied his place in the defence of the castle, and assault after assault was repulsed with great slaughter.

"The noble lady," says Froissart, to whose Chronicle we now revert, "comforted them greatly within; for by all regard of such a lady, and by her sweet deportment, a man ought to be worth two men at need."

The siege continuing, it was determined to send for succour to the king. Edward, then lying at York, but no one would undertake the mission, so unwilling were all to leave their beautiful and brave mistresses. At length Sir William Montague (a relation, probably, as if it please you; your dinner is all ready. 'Ah, fair lady,' quoth the king, 'other things lie that my heart I cannot.' Then the lady said, 'Ah, right noble prince, for God's sake nor tempt me; I cannot believe that so noble a prince as ye be would think to dishonour me, and my lord my husband, who is so valiant a knight, and hath done your grace so good service, and as yet lieth in prison for your quarrel. Certainly, sir, ye should in this case have but a small praise, and nothing the better thereby. I had never as yet such a thought in my heart, nor, I trust in God, never shall have for no man living; if I had any such intention, your grace ought not only to blame me, but also to punish my body, yea, and by true justice to be dishonoured.' Herewith the lady departed from the king, and went into the hall to haste the dinner. When she returned again to the king, and brought some of his knights with her, and said 'Sir, if it please you to come into the hall, ye shall make good cheer and be joyful, seeing yet two kings, Edward and David, were at a certain period have chased away you enemies, who durst not abide you: let other men study for the remnant.' Then the king said, 'Ah, dear lady, know for truth that since I entered into the castle there is a study come to my mind, so that I cannot choose but to muse, nor I cannot tell what shall fall thereof; put it out of my heart I cannot.'

Ah, sir,' quoth the lady, 'ye ought always to make good cheer to comfort therewith your people. God hath aided you so in your business, and the same day that the Scots departed from the said royal castle, King Edward came thither with all his host about noon, and came to the same place whereas the Scots had lodged, and was sore displeased that he found not the Scots there; for he came thither in such haste, that his horse and men were sore travelled. Then he commanded to lodge there that night, and said how he would go see the castle, and the noble lady therein, for he had not seen her here since she was married before. Then every man took his lodging as he list. And as soon as the king was unarmed, he took a ten or twelve knights with him, and went to the castle to salute the countess of Salisbury, and to see the manner of the assaults of the Scots, and the defence that was made against them. As soon as the lady knew of the king's coming, she arrayed herself as beautiful as she could, and went out with so rich a beauteous, that every man marvelled of her beauty, and could not cease to regard her nobleness with her great beauty, and the gracious words and countenance she made. When she came to the king, she kneeled down to the earth, thanking him of his succours, and so led him into the castle, to make him cheer and honour, and that he might do it. Every man regarded her marvellously; the king himself could not withstand his regarding of her, for he thought that he never saw before so noble a fair lady: he was stricken therewith to the heart with a sparkle of fine love, that endured long after; he thought no lady in the world so worthy to be beloved as she. Thus they entered into the castle hand in hand, and the king was entertained into the chamber nobly apparelled. The king regarded so the lady that she was abashed. At last he went to a window to rest him, and so fell in a great study. The lady went about to make cheer to the lords and knights that were there, and commanded to dress the hall for dinner. When she had all devised and composed, then she came to the king with a merry cheer, who was in a great study, and she said, 'Dear sir, why do ye study so far? Your grace not displeased, it appertaineth not to you so to do; rather ye should make good cheer and be joyful, seeing ye have chased away your enemies, who durst not abide you: let other men study for the remnant.' Then the king said, 'Ah, dear lady, know for truth that since I entered into the castle there is a study come to my mind, so that I cannot choose but to muse, nor I cannot tell what shall fall thereof; put it out of my heart I cannot.'

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“at London, making cheer to the Earl of Salisbury, who was now come out of prison.”

But Froissart’s account of Edward and the Countess does not end here. It appears that Edward gave a sumptuous feast in the city of London, purposely that he might see the Countess again. That lady came sore against her will, for she thought well enough wherefore it was; but she durst not discover the matter to her husband; she thought she would deal so as to bring the king from his opinion. This was a noble feast . . . . All ladies and damsels were freshly been seen according to their degrees, except Alice, countess of Salisbury, for she went as simply as she might, to the intent that the king should not set his regard on her, for she was fully determined to do no manner of thing that should turn to her dishonour nor to her husband’s.”

Now was it at this very feast that the garter was dropped? However that might be, our readers will perceive with what new interest the romantic tradition relating to the Order becomes invested by its connection with the exquisite story narrated in the foregoing pages.

IMPROVED FRIENDLY SOCIETIES.

[From Mr. Tufnell’s Report to the Poor-Law Commissioners.]

Unfortunately the erroneous principles on which Friendly Societies are generally founded have materially curtailed their benefits and diminished the confidence that might be reposed in them. But I will describe one founded on the most scientific principles, which will explain more clearly what the poorer classes might do to help themselves and avoid pauperism, were these institutions placed within their reach.

The County of Kent Friendly Society was founded in 1838, almost entirely through the exertions of the Rev. J. Hodgson, vicar of St. Peter’s, Isle of Thanet, the honorary secretary, to whose able and vigilant superintendence it is chiefly indebted for its efficiency. It now extends by means of branches throughout the county, and has formed the model for other similar associations in various parts of England. I have examined the regulations of many Friendly Societies, but have never seen one equalling this in the apparent accuracy of its calculations, or in the care with which it provides for every contingency affecting human life in a manner that is capable of being subjected to calculation. I proceed to describe what a labouring man may do by the aid of this society to help himself in the various ailments by which he may be afflicted.

I will suppose a young man, 20 years of age, able to lay by 1s. 6d. a-month, or 4d. a-week, not a very heavy tax in any county, but trifling where wages are 12s. a week, as they are in these counties.* For this payment the society will secure to him 8s. a-week whenever he is ill, until he attains the age of 65, when 6l. will be given him, and at his death 6l. will be given to bury him; or if he does not like these advantages, he may have instead of them, and for the same payment of 4d. weekly, the sum of 16l. paid to the person entitled to receive it. Several of the preceding cases assure considerable sums to be paid at an advanced age, and in every case the person entitled to the money is assumed to be in a high degree of independence, or is making provision for his children, when fairly laid down when the child is under two, will entitle to a certain pension. In either of these cases, should the child die before the age of 10, the money paid will be returned.

Several of the preceding cases assure a considerable sum to be paid at an advanced age, and in every case the person entitled to the money is assumed to be in a high degree of independence, or is making provision for his children, when fairly laid down when the child is under two, will entitle to the money.

What is Frederick Short, aged 27 next birthday, to pay monthly for 12s. weekly pay in sickness until 65, a pension of 16l. at 65, and 6l. to bury him?—Answer, 1s. 4d.

What is John Peacock, aged 15 next birthday, to pay monthly for 6s. weekly pay in sickness until 65, a donation of 6l. at 65, and 6l. to bury him?—Answer, 1s. 0d.

What is John Jackson, labourer, aged 24 next birthday, to pay monthly for 12s. weekly pay in sickness, a donation of 8l. at 65, and 12l. to bury him?—Answer, 2s. 9d.

What is James Walker, labourer, aged 24 next birthday, looking forward to a time when, by reason of old age, he shall be able to work no longer, desires to provide an allowance of 4s. to be paid to him weekly from the age of 60 until he dies: what must he pay monthly for it until 60?—Answer, 1s. 4d.

What monthly contribution will John Jackson have to pay monthly for 12s. weekly pay in sickness, a donation of 8l. at 65, and 12l. to bury him?—Answer, 2s. 9d.

What monthly contribution will John Jackson have to pay to assure to his son William Jackson the sum of 5l., to be paid at the end of 12 years?—Answer, 6d.

The apparently extravagant advantages for such trivial payments may appear incredible to persons unacquainted to calculations of this sort; but any actuary will prove their accuracy. They seem to me to prove, that were societies of this description universally set on foot and encouraged, there would be little need for the poor-rates. If a young man can only lay by 6d. a-week, which is perhaps not a fourth part of what he spends in beer, he may be secured in independence for life. I know from experience how willing labourers are to avail themselves of the advantages held forth by these associations, especially in that department relating to endowments for their children, when fairly laid before them and explained by the clergyman or any one in whom they have confidence.

* Kent and Sussex.

**Weight and Heat of Air.**—A pound-weight of air taken near the level of the sea is closer than that taken from a high part of the atmosphere, where it is thin, and occupies a much larger space. This explains why the thin air on high grounds is seemingly colder than on low situations. Properly speaking, the cold in high situations arises from the want of air rather than from the air itself.
THE MAPLE.

It would no doubt be highly interesting if we could have the opportunity of observing each of the thirty or forty species of the maple genus in one spot, as in the case of the pines at Dropmore and the willows at Woburn; but although about thirty species of the maples of Europe, of North America, and the mountainous parts of India have been introduced into Great Britain, the genus is neither so important as the pines nor so interesting as the willows; and there being little inducement to form collections with a view of studying their character and peculiarities, we must be content to seek for specimens in many different places. They are each to be found either in the gardens of the Horticultural Society, in those at Kew, in the great nurseries in the neighbourhood of London, or in the pleasure-grounds of noblemen and gentlemen of taste and fortune. Even those species which would be a valuable addition to our stock of timber-trees are not likely to be introduced except with a view to ornament and embellish the landscape; for the shortest and readiest means of obtaining the timber which they would yield is by importation from their native forests, and this being the case, it would be in vain to expect that good land, which they generally require, should be devoted to the cultivation of even the most valuable kinds of maple as an object of profit. The owners of parks and pleasure-grounds, therefore, who are at the pains of introducing exotic maples, display their munificence as well as taste.

The maples may be classified in three divisions, according to their size: the well-known sycamore, with its broad leaves and large timber, being a type of one class; the common maple, inferior in size, and with leaves very much smaller, representing another; after which we have the more diminutive varieties, which are chiefly valuable for ornamental planting. The sap of all the maples abounds in saccharine matter; and in North America, where they form extensive forests, sugar is extensively made from two species, though the black sugar maple is by far the least productive of the
two. Sugar has been made from other species in the north of Europe. The process of making maple-sugar has already been fully described (Vol. IV., No. 194). As timber-trees also, several of the North American maples are the most valuable which the gigantic forests of the New World produce. The sycamore and the common maple are the species chiefly known in Great Britain. Of the former we may have an opportunity of speaking at another time. The latter is still, as in the time of Gerard, a hedge-row tree. Its height does not often exceed twenty feet; but in a deep and fertile soil, and in sheltered situations, they attain a height of thirty or forty feet. The blossoms appear about the middle of April, and the leaves usually about a fortnight later. The wood is often beautifully veneered, and is well adapted to our climate. Its yellow was introduced into England by Sir Charles Wager, in 1725, and is prized as an ornamental tree on account of its graceful form, fine foliage, and the profusion of its blossoms. The sugar-maple grows also to a large size, and the wood, which at first is white and afterward assumes a reddish hue, is much used for furniture and bears a high polish. The Norway maple and the Italian maple are the two most important species on the continent of Europe. The former resembles the sycamore, and is one of the commonest trees in the forests of Russia, after the birch and the trembling poplar; it was introduced into England before the end of the seventeenth century. The opal or Italian maple is very common in the south of Europe, and is frequently planted by the roadside for the sake of the shade which it affords. The wood is close and compact, and the roots are remarkable for the curious "bird's-eyes" or knots which they contain, and being hard they are polished and used for inlaying tables, inlaying-work, &c., and specimens in which the "knurs and nodosities are rarely diapered" fetched a high price. He states that for ornamental purposes it was worked so thin as to be almost transparent. It is said that the maple is not indigenous in Scotland.

Mr. Loudon has collected a number of the United States species of timber-maples. In Tartary, where a peculiar species is found, and which is known in this country as the Tartarian maple, the seed-lobes, vernacularly called "keys," after being stripped of their wings, are boiled, and eaten with milk and butter. In North America cattle and horses are turned into the woods in spring to browse on the young shoots of the striped-bark maple, and the leaves in a dry state are also much relished. The wood is white and of a fine grain, and is used by cabinet-makers as a substitute for the holly. The large or long-leaved maple is one of the finest forest-trees of North America, and is sometimes found growing to a height of ninety feet, with a trunk sixteen feet in girth, and a circumference of fifteen feet. The wood, when sawn, is often beautifully veined, trembling poplar; it was introduced into England by Tradescant in 1636. The timber is employed very extensively in the United States both for useful and ornamental articles, and before mahogany came into such general use it was employed whenever elegance and beauty were desired in furniture. Its richness and lustre, when highly polished, equals, if it does not exceed, the finest mahogany. In old trees the grain is sometimes found beautifully undulated, and this, when worked and polished, displays very pleasing effects of light and shade. The white maple, another North American species, is also a large timber-tree: the wood is lighter and softer than the red maple, is very white, and possesses a fine grain. It was introduced into England by Sir Charles Wager, in 1725, and is prized as an ornamental tree on account of its graceful form, fine foliage, and the profusion of its blossoms. The sugar-maple grows also to a large size, and the wood, which at first is white and afterward assumes a reddish hue, is much used for furniture and bears a high polish. The Norway maple and the Italian maple are the two most important species on the continent of Europe. The former resembles the sycamore, and is one of the commonest trees in the forests of Russia, after the birch and the trembling poplar; it was introduced into England before the end of the seventeenth century. The opal or Italian maple is very common in the south of Europe, and is frequently planted by the roadside for the sake of the shade which it affords. The wood is close and compact, and the roots are remarkable for the curious "bird's-eyes" or knots which they contain, and being hard they are polished and used for inlaying tables, inlaying-work, &c., and specimens in which the "knurs and nodosities are rarely diapered" fetched a high price. He states that for ornamental purposes it was worked so thin as to be almost transparent. It is said that the maple is not indigenous in Scotland.

Inscriptions on the Statue of Memnon.

The colossal figure of King Amenoph, or Phaemonoth, on the plain of Thebes in Upper Egypt, was celebrated, above eighteen centuries ago, for a miraculous sound frequently emitted by it soonafter sunrise, which the vulgar supposed to be a salutation to the sun, but which is now supposed attributed to natural causes, although inexplicable by them. Certain however it is that the sound was heard; royal persons visited the colossus and wrote their names on it. The latter is still, as in the time of Gerard, a hedge-row tree. Its yellow was introduced into England by Sir Charles Wager, in 1725, and is prized as an ornament tree on account of its graceful form, fine foliage, and the profusion of its blossoms. The sugar-maple grows also to a large size, and the wood, which at first is white and afterward assumes a reddish hue, is much used for furniture and bears a high polish. The Norway maple and the Italian maple are the two most important species on the continent of Europe. The former resembles the sycamore, and is one of the commonest trees in the forests of Russia, after the birch and the trembling poplar; it was introduced into England before the end of the seventeenth century. The opal or Italian maple is very common in the south of Europe, and is frequently planted by the roadside for the sake of the shade which it affords. The wood is close and compact, and the roots are remarkable for the curious "bird's-eyes" or knots which they contain, and being hard they are polished and used for inlaying tables, inlaying-work, &c., and specimens in which the "knurs and nodosities are rarely diapered" fetched a high price. He states that for ornamental purposes it was worked so thin as to be almost transparent. It is said that the maple is not indigenous in Scotland.

Mr. Loudon has collected a number of the United States species of timber-maples. In Tartary, where a peculiar species is found, and which is known in this country as the Tartarian maple, the seed-lobes, vernacularly called "keys," after being stripped of their wings, are boiled, and eaten with milk and butter. In North America cattle and horses are turned into the woods in spring to browse on the young shoots of the striped-bark maple, and the leaves in a dry state are also much relished. The wood is white and of a fine grain, and is used by cabinet-makers as a substitute for the holly. The large or long-leaved maple is one of the finest forest-trees of North America, and is sometimes found growing to a height of ninety feet, with a trunk sixteen feet in girth, and a circumference of fifteen feet. The wood, when sawn, is often beautifully veined, trembling poplar; it was introduced into England by Tradescant in 1636. The timber is employed very extensively in the United States both for useful and ornamental articles, and before mahogany came into such general use it was employed whenever elegance and beauty were desired in furniture. Its richness and lustre, when highly polished, equals, if it does not exceed, the finest mahogany. In old trees the grain is sometimes found beautifully undulated, and this, when worked and polished, displays very pleasing effects of light and shade. The white maple, another North American species, is also a large timber-tree: the wood is lighter and softer than the red maple, is very white, and possesses a fine grain. It was introduced into England by Sir Charles Wager, in 1725, and is prized as an ornamental tree on account of its graceful form, fine foliage, and the profusion of its blossoms. The sugar-maple grows also to a large size, and the wood, which at first is white and afterward assumes a reddish hue, is much used for furniture and bears a high polish. The Norway maple and the Italian maple are the two most important species on the continent of Europe. The former resembles the sycamore, and is one of the commonest trees in the forests of Russia, after the birch and the trembling poplar; it was introduced into England before the end of the seventeenth century. The opal or Italian maple is very common in the south of Europe, and is frequently planted by the roadside for the sake of the shade which it affords. The wood is close and compact, and the roots are remarkable for the curious "bird's-eyes" or knots which they contain, and being hard they are polished and used for inlaying tables, inlaying-work, &c., and specimens in which the "knurs and nodosities are rarely diapered" fetched a high price. He states that for ornamental purposes it was worked so thin as to be almost transparent. It is said that the maple is not indigenous in Scotland.

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Some of the inscriptions are written in Latin, and pretty correctly. Most are in Greek, and these, with a few exceptions, are misspelled, and ungrammatically expressed. This perhaps might have been expected.
as written by foreigners; but the official Greek papyri published by the British Museum show that such was the ordinary Greek of Egypt.

The first traveller who made these inscriptions known to Europe was Pococke, who about a century ago copied fifty-six of them, which he placed in their relative positions as found on the colossus. His time was very short, only half a day; in consequence was not able to take all, and some which he did take, he copied imperfectly; but upon the whole he far surpassed both in number and accuracy all who came after him, until Salt, whose official residence in Egypt gave him ample opportunities, furnished a complete copy of the whole. These have been carefully read by Mons. Létronne, from whom nearly the whole of this article is taken.

The earliest dated inscription is of the 16th March, A.D. 64. This we give entire, as a specimen:

A INSTTVLVS, TENAX PRIMI PILARIS LEG XII ET L QVINTIVS VITATOR DECURIO AVDIMVS MEMNONEM ANNO XI NERONI SIMP N XVII APRIL HQR.....

(A. Instuleius Tenax, General of the 12th Thundering Legion, and L. Quintius Viator, decurion, we hear Memnon, in the 11th year of our Emperor Nero, 17th Calends, April, ..... ) The hour is obliterated.

About two dozen of the inscriptions state no more than that the writers heard the sound; of these six were Prefects or Governors of Egypt under the Roman empire; most of them are dated, and some of the writers record their having been favoured twice in one day.

Towards the close of the year 130 the colossus was seen by the emperor Adrian, accompanied by his wife and several attendants, some of whom record their visit. The emperor himself heads the list with his name and title only, "Imperial. Adrianus," in Latin with a Greek ending; probably executed by a Greek, who tried to make it Latin. The record of the empress is in Greek; it states, "I, Sabina Augusta, wife of the emperor Augustus, heard Memnon at the ..... hour." The number is effaced. Here it may be proper to remark, that from the similarity of names or sound causes the Greeks and Romans supposed Memnon to be the Memnon of Homer. The following inscriptions show this. The first is in Greek verse, with an introduction, but no name:— "When I went to see Memnon, with the august Sabina. I too will adore thee, Memnon, son of Tithon, sitting by Thetis, the city of Jupiter; or Amenoth, king of Egypt, as is declared by the priests, who are conversant with ancient fables."

The second is also in Greek verse, in a curious Eolic dialect:— I, Balbilla, heard the divine voice of Memnon, or Phamenoth. I came, together with the beloved Queen Sabbina [sic] while the sun was marking the first hour, in the fifteenth year of King Adrian, on the 24th day of Athyr. It was the 25th day of the month Athyr. This last line appears to have been added to correct a mistake made in the first. The month Athyr began on the 28th of October, and the 25th was consequently the 21st of November.

Another inscription in Greek, apparently by the same lady, is much effaced, but enough remains to show its text:— "Hail ready-voiced divinity, thou hast a tongue. The most ..... he paid the penalty. But I ..... For my pious forefathers ..... Balbillus the wise, and Antiochus, ..... Balmillus was of a royal mother, and his father's father was Antiochus; from them I derive my noble blood. By me, Balbilla."

* This was probably the Balbillus (in some copies Babillius)

The allusion to Cambyses is brought in, because it was believed that the statue of the king had been broken by his orders, when he conquered Egypt in the sixth century before Christ. When Strabo and Pausanias visited Egypt, the lower half of the figure only was standing, the upper portion having been since repaired, not by putting the original piece in its place, but by thirteen horizontal layers of sandstone.

Another Greek inscription, much obliterated, seems to say that the royal party was at first disappointed; that the queen was very angry, and that even the king was somewhat disturbed; until Memnon, fearing his wrath, gave the required sound. The next day was the casting at the first visit, the party had reason to believe; but at a subsequent one, when, if Julia Camilla is to be trusted, they were favoured with three salutations. This lady (whose name has been read Ballback, supposing her to be the same as the writer above mentioned, but which cannot really be so read, being either Balbilla or Camilla), in a Greek inscription of some length, describes the kind of tone she heard; and as this has excited some interest, we give it in full:

"By Julia Camilla, when the emperor Adrian heard Memnon. I had heard that the Egyptian Memnon, when struck by the sun's rays, emitted a sound from the Theban rock. When I saw Adrian, the king; he hailed him, as well as he could, before the sun rose. When Sol, driving his white coursers through the ether, measured the second hour on the shadow, Memnon again sounded, with a sharp sound, like brass which is struck upon. Again he saluted him, sounding a third time. King Adrian heard, and twice returned the salute. There are two lines more, but I cannot read them, which appear to say that it was plain that Adrian was much beloved by the Gods, since such a favour was bestowed upon him.

The sort of sound thus described by Julia Camilla goes far to support a conjecture of M. Langle's on its cause, which was in some degree anticipated by Strabo, and has since received confirmation from a discovery of Sir J. G. Wilkinson. It must be observed that memorial hearers do not speak of the sound as metallic, but rather vocal. Tacitus calls it so, on the authority of Germanicus. Pausanias likened it to what would be produced by breaking a musical chord, such as a harp-string. Strabo compared it to the sound made by a slight blow, and he thought it was caused by artificial causes. Several modern writers have been inclined to attribute it to natural causes; and have supposed it might be produced by the expansion of the minerals of the stone at sun-rise, when the heat might force it to the surface. This conjecture received some support from the fact that tones are actually produced in those circumstances: Humboldt speaks of such sounding from the rocks on the banks of the Orinoko; the French expedition heard similar ones at Cannak; and Augustus St. John, while examining the temple of Venus at Dendera, heard a loud sound "undoubtedly the effect of heat." M. Langles thought a few hammers might be acted upon by an artifice of the Egyptian priests to strike upon stones in the way some Chinese musical instruments are said to be made, and of which the Rock Harmonicon now in London is a good specimen. In the year 1824, Sir J. G. Wilkinson mounted by the aid of a high ladder to the back of the statue, and there found that a large block of grit-stone, fixed just above the girdle of the figure sounded like brass on being struck. At that epoch he was not acquainted with the inscription of Julia Camilla, and he could hardly suppose that the metallic sound he then heard could be that described as the breaking and Balbilla) mentioned by Seneca in his 4th book of "Questions on Natural History," as a Prefect of Egypt and a learned man, from whom he draws much of his information on that country.
of a harp-string; though he had some suspicions, which were strengthened by noticing a hollow cut in the colossus quite large enough to conceal a man, within reach of the sonorous block. A few years after, being made acquainted with the inscription, he determined to try the effect on other persons, and, with that view, in the year 1830, he placed some Egyptian peasants at the base of the statue, and again ascended to the girdle; as soon as he struck the rock, the people below cried out, "You are striking brass." This convinced the discoverer of the truth of his conjecture.

If the voice of Memnon was produced by the discovery of the voiceless hollow, it was not easily removed. He reads: "Memnon was formerly entire, but called a level or a spirit level is constructed by instrument-makers, in which a telescope is ranged parallel out, "You are striking brass." This convinced the discoverer of the truth of his conjecture.

Another inscription alludes to the air-occupied in the small portion of the tube not filled with the spirit; and this bubble maintains a position exactly in the middle of the tube when the latter is horizontal; so that the horizontality of the tube can at any time be determined by the position of the air-bubble. The telescope is so connected with the tube by adjusting screws, that it can be made to conform to the horizontality of the latter. There are many other adjustments of much complexity in the instrument; but it will be sufficient for us here to state that the ultimate object of them is to ensure a perfect horizontality in the telescope.

The surveyor looks through the horizontal telescope at a mark some distance off, and this mark is so constructed as to show the horizontality of the ground. The mark is called by the several names of the levelling-staff, levelling-pole, station-pole, or station-staff, usually the first; it consists of a straight mahogany or oaken staff, graduated into feet and inches, and having a vane or conspicuous object capable of sliding up and down it. A cross-line or a central spot in the centre of the point to which the other levelling-staff is fixed, the telescope; and the graduations on the staff show how high the vane is from the ground at the time when it is in a right line with the telescope.

These being the chief instruments, the course of proceeding is somewhat as follows:—Supposing a distance of several miles is to be surveyed or "levelled," the distance is divided into a number of convenient portions, which are levelled one after another. Pegs are driven into the ground at all these stations, to indicate them more clearly; and three stations are brought into use at once, viz., a central one at which the telescope is placed, and two at equal distances on either side of the former, at which levelling-staves are erected by two assistants. The observer places his telescope exactly in the right line between the two staves, and having adjusted it horizontally, he looks through it to one of the staves, signalling the assistant to raise or lower the vane on the staff until the centre of the vane is visible through the centre of the telescope. He then reverses the telescope, and indicates to the other assistant the other levelling-staff, the vane of which he causes to be raised or lowered in like manner. The exact height of each vane above the ground is then noted, by means of the graduations in the staff; and if the two heights are equal, then the ground at
the two stations is of equal elevation; but if unequal, then one station is higher than the other by the particular spots, with a view to see whether those spots ever afterwards may appear to rise or sink, the precise focus of the spots being observed with much moment, and was effected in the following manner: there are three stations on the shore of the British Channel, at or near Portishead, Wick Rocks, and East Quantockshead; and one on the English Channel at Axmouth. Just below the port at Portishead, a place was selected in the solid rock on the shore, and in this inserted horizontally a cylinder of iron, two inches diameter and fifteen inches long, containing in its centre a brass wire one-eighth of an inch in diameter, which marks the position of the standard point, about eight feet above the highest water-mark. The mark at East Quantockshead consists of a block of granite, a ton and a half weight (the gift of the corporation of Bridgewater), in which is inserted horizontally a copper cylinder, an inch in diameter and fourteen inches long. A similar block of granite, with a similar copper cylinder inserted horizontally in it, forms the mark at Wick Rocks, and also that of Axmouth. In every case, the gentlemen owning the property where the marks are fixed have aided the Association in their object, and have consented to become the guardians of these positions.

The object was to ascertain the relative heights of particular spots, with a view to see whether those spots ever afterwards may appear to rise or sink, the precise focus of the spots being observed with much moment, and was effected in the following manner: there are three stations on the shore of the British Channel, at or near Portishead, Wick Rocks, and East Quantockshead; and one on the English Channel at Axmouth. Just below the port at Portishead, a place was selected in the solid rock on the shore, and in this inserted horizontally a cylinder of iron, two inches diameter and fifteen inches long, containing in its centre a brass wire one-eighth of an inch in diameter, which marks the position of the standard point, about eight feet above the highest water-mark. The mark at East Quantockshead consists of a block of granite, a ton and a half weight (the gift of the corporation of Bridgewater), in which is inserted horizontally a copper cylinder, an inch in diameter and fourteen inches long. A similar block of granite, with a similar copper cylinder inserted horizontally in it, forms the mark at Wick Rocks, and also that of Axmouth. In every case, the gentlemen owning the property where the marks are fixed have aided the Association in their object, and have consented to become the guardians of these positions.

As a means of comparing all these stations with one common standard, Mr. Bunt commenced operations at Bridgewater, and assumed as zero, or 0, a point one hundred feet below the surface of the ground: in principle, it would have been just the same to have taken the level of the ground as a standard; but there were certain practical advantages which would have aided the Association in their proceedings.

The first station being determined, Mr. Bunt proceeded as follows:—the distance from Portishead to Axmouth, about seventy-four miles, was divided into stages of about ten miles each; and these stages were further broken up into smaller distances of about four chains, or eighty-eight yards each. The telescope was placed at these different points, or distances, and the vanes were erected on the pegs driven into the ground, and levelling-staves were placed on these vanes to obtain the relative elevations of the ground. The observations were then made, and so accurate were the instruments, that an elevation of one of the vanes only 1-40th of an inch was perceptible at a distance of eighty-eight yards. The observations were repeated several times for the avoidance of error, and every particular minutely recorded in a book. From each position of the telescope two stations were viewed, the one eighty-eight yards towards the north, and the other an equal distance towards the south (or nearly so, on an average of the whole); and the station last determined became a standard for the next distance of one hundred and seventy-six yards. The height of the ground at every station was correctly entered, the highest being at East Quantockshead, where the iron bar was two hundred and six feet above the standard zero; and the lowest at Axmouth, where the copper bar in the block of granite was eighty-four feet above the standard. From careful observations of the high and low tides in each of the two channels, the water was found to be about seventy-three feet above the standard. The measurements are recorded in the Transactions of the Association to so minute a quantity as 1-10,000th part of a foot, so that any dislocation will be readily observable in future years.
No inconsiderable portion of the life of a Roman paesana is spent at the fountain, or brook, or river-side. Thither she goes morning and evening, for the supply of water necessary to supply her family, there she washes her own and her husband’s and children’s clothes, and there oftentimes on the Sunday or Saint’s day morning she completes her festal toilette, making the clear water supply the place of a mirror. There too she meets her neighbours and talks over the events of the day, the humble but not always unexciting occurrences of the district (for the brigands are sometimes abroad, or an old feud has broken out between this village and that, and blows have been given and knives drawn, or some wild buffaloes of the Pontine Marshes have been killing their herdsmen). The fountain is to the women what (in the larger villages) the barber’s shop is to the men—the place for sauntering and gossiping. In the days of old Rome the barbers were the greatest gossips, and their shops the great gossiping places of Rome. They are so still. But the people of better condition—i galantuomini—in the small towns and villages, where there are no coffee-houses, congregate and gossip in the spezierie, or apothecaries’ shops. Every evening some group or other is found collected round the spot. The earthen vases, often so graceful and so classical in their outline, are deposited upon the stone brink, to be filled, one after the other, and the women, giving themselves up to the genius of the place, discourse volubly, and faster than the water flows. Now and then the picture is improved by the arrival of some hind with his tall cream-coloured oxen “fatigued with the plough,” or of a shepherd or goat-herd with his flock, or of some muleteer that stops to make his thirst and refresh his mules, or of the collecting lay-brother of some Franciscan, Capuchin, or other monastery of the mendicant orders, who is on his way homeward, and must be home before the bells have done chiming the ‘ Ave-Maria,’ but who, nevertheless, must find time to take his bisaccia, or begging-bag, from his shoulders (well or ill filled according to his luck, persuasiveness, or circumstances), to rest himself for a while, and commune with the matrons and damsels clustering round the fountain. Scenes of this sort constantly present themselves in the Roman states and the Neapolitan kingdom, as also in the south of Spain (where many of the fountains are works of the Moors) and (only with some trifling differences) in Greece, Turkey, and all through the East. The fountain, or the well—like that outside of the town of Samaria, to which the woman with her water-pot came to draw water, when “Jesus, being wearied with his journey, sat on the well,”—is, in all these countries, found outside of nearly every town and village. It is here, after the heat of the day, that the village gossips congregate, “Cum ibi sol tepidus phares adnocerit aures,” or when the cooling sun calls forth most listeners.

In the Roman states many of the fountains—though the stone-work be injured and the sculpture on them defaced—are at least as ancient as the days of Horace,
are shaded by the tree he so much admired (the ilex), and are worthy altogether of the praise he bestowed on the Fons Bandusiae, whose water, clearer than glass (speditior vitro), gushed, with a cooling sound, through hollow rocks. As the bright but brief twilight fades away, the women, collecting their washed clothes or balancing their vases on their heads, walk homeward with an erect gait, the gossips suspend their long stories, and singly, or in little groups, the parties disapper, with their Santa Notte! or Good (or holy) night to you!

RAILWAY GOODS-TRAFFIC.

Among the arrangements which the railroad system has called into existence, the conveyance of merchandize is one which does not come under the cognizance of the majority of persons. The operations of procuring, placing by railway, proceeding by an omnibus to the terminus, hastening to the proper carriage, passing over the ground with a speed of twenty or thirty miles an hour, and leaving the train at the destined station— are now more or less familiar to most persons. But the consignment to London of the manufactured products of Birmingham, Manchester, or any other large town, is almost the only event from those which govern passenger-traffic. Of this system we will attempt to present a sketch.

An opinion pretty extensively prevails that the railroad companies are the carriers of goods on their own railways; but this is true only to a partial extent. Three modes of proceeding are adopted by different railroads in this country, viz. the London and Birmingham Railway; the Company being their own carriers: 2, as on the London and Birmingham Railway; the Company having nothing to do as carriers, but allowing the regular carriers to use the railway on payment of a certain toll: 3, as on a few minor railways in the north of England, where both the other systems are combined, the Company and the carriers competing one with another.

The comparative advantages and disadvantages of these three systems form an intricate subject, into which we do not propose to enter; both in committee-rooms of the House of Commons and in courts of law, questions of much difficulty have arisen in respect of one or other of these systems. It happens, however, that on the railway which forms the metropolis, viz. the London and Birmingham, the system of open competition is adopted; and the very nature of this competition, coupled with the immense extent of the daily traffic to the metropolis, renders this railway a peculiarly advantageous one for watching the practical working of one of the carriers' establishments. The firm of Pickford and Co. have kindly permitted us to visit their goods-depot at the terminus of the London and Birmingham Railway near Euston Square for passenger and luggage traffic only; none of the heavier goods are brought so far down the line, but are left at the Camden Town station, about a mile distant. Whoever has watched the goods-waggons, however (which are distinct from the passenger-trains), proceed from the railway somewhat eastward, into a large area of ground intersected by pairs of rails in every direction. Here we lose sight of them; and it is only by approaching nearer to the scene that we can witness the subsequent proceedings. It is the separation of the goods from the passenger traffic at this spot which renders the former less generally familiar, and the system by which it is governed less generally known.

On proceeding to the eastern side of the railway, near the western end of Park Street, Camden Town, a road called the Oval Road leads to the extensive depot of the Company. Here the number of goods-waggons or trucks seems to be almost endless: on every side they are ranged in rows, more or less independent of the Company. Tracksof rails are laid down by the Railway Company in various directions, to lead to the different carriers' warehouses, as a means of bringing the laden waggons close up to the warehouses where they are unloaded. Each carrying-firm is thus enabled to transact the business of its own customers without interfering with the rest; and all are alike dependent on the Company for the use of the railway and waggons, and for locomotive power. In the infancy of railway communication it was expected, and the legislature seems to have designed, that the railways should be, like canals and turnpike-roads, another. The experience of districts, viz. the London and Birmingham Railway, has, however, shown that the lives of passengers would be placed in the most imminent peril unless the locomotive engines on a railroad were all placed absolutely under one superintendence and management, to be sent backwards and forwards at such times as would not only be commercially convenient, but as would also prevent a liability to collision or other accident. But such a superintendence could hardly be exerted if the engines belonged to different persons, each of whom would naturally wish to make arrangements most suitable to his individual trade; and hence it has resulted that the companies have practically a monopoly where none was intended. A Committee of the House of Commons, although it has suggested various checks upon the companies, has not proposed to interfere in respect to the proprietorship of the engines; and the carriers, therefore, one and all, have to pay the companies for the use of locomotive power. It is for this reason, among others, that the Company's goods-depot must necessarily be that of the carriers and not the railway.

The above particulars relate to the position in which carriers stand to the railway; but the system requires for its due comprehension that we should follow the practical workings of one of the carriers' establishments. The firm of Pickford and Co. have kindly
allowed us to witness the practical arrangements of their establishment with this object.

The depot of this firm at Camden Town has been recently built from the designs of Mr. L. Cubitt, with express reference to the requirements of railway traffic, as the depot in the City-road has been for canal traffic. There are two distinguishing features in its general arrangement, viz. the accommodations for receiving railway waggons, to be laden for the 'down' passage or unladen for the 'up' passage; and those for common road-waggons, employed either anterior or subsequent to the railway transit. The 'down' trade from London, and the 'up' trade to London, are so totally distinct, that the arrangements of the warehouse, the clerks, the porters, &c., are divided into two sections, irrespective of each other. This being understood, we shall be able to speak more clearly of the several arrangements for the 'up' and 'down' traffic.

On view the eastern end from without, we find it to be a large roofed building, bounded on the north by the Regent's Canal, and on the west by open ground contiguous to the railway, while its eastern front is in the road by which most of the carriers approach the Company's depot. The building is placed in connexion with the railway by a bridge passing from the northern end of the warehouse, carrying on a line of track which joins the Company's rails. Within the building presents a busy assemblage of the various arrangements incidental to such an establishment. At the southern end are the chief offices and counting-houses, one for 'up' and another for 'down' traffic; at the eastern side is the entrance by which waggons are drawn by horses into or out of the building; at the northern end is the entrance for the railway waggons, and on the western side is a temporary enclosure, to be removed on a future enlargement of the building.

Nearer from end to end of the building extends a platform, about five feet above the general level of the warehouse; and from this platform we can obtain a good view of the general disposition of the interior. All on the eastern side of the platform, as well as the eastern half of the platform itself, are appropriated to the 'up' traffic; while all on the western relate to the 'down' traffic. From the eastern edge of the platform project a number of piers, or standing-places, on the same level with it; and between these waggons can be drawn up to be laden. A range of about a dozen posts, each indented with two recesses obliquely situated, and connected by a horizontal rail, forms an entrance for common road-waggons, instead of the usual series of stabling for upwards of a hundred horses. Besides, there are two large circular turn-plates, one of those admirable contrivances for turning a heavy waggon of carriages or carriages of heavy waggons. At every few yards in the length of this railway occurs a circular turn-plate, one of those admirable contrivances for turning a heavy waggon or carriage of carriages, for the purpose of receiving goods into the warehouse; and when once turned into a recess, each immediately knows its own bell, and separates itself from the rest.

The affection of these animals for their madrinas saves infinite trouble. It is nearly impossible to lose an old mule; for if detained for several hours by force, she will, by her power of smell, like a dog, track out her companions, or, for attending to the muleteer, she is the chief object of affection. The feeling, however, is not of an individual nature; for I believe I am right in saying that any animal with a bell will serve as a madrina. In a troop each animal carries, on a level road, a cargo weighing 146 pounds (more than twenty-nine stones); but in a mountainous country, a hundred pounds less. Yet with what delicate limbs, without any proportional bulk of muscle, these animals support so great a burden! The mule always appears to me a most surprising animal. That hybrid should possess more reason, memory, obstinacy, social affection, and powers of muscular endurance, than either of its parents, seems to indicate that art has here outmastered nature.

Social Habits of the Mule in the Cordilleras.—Our manner of travelling was delightfully independent. In the inhabited parts we bought a little firewood, hired pasture for the animals, and bivouacked in the same field with them. Carrying an iron pot, we cooked and eat our supper under a little tent. Light and lively, each animal carried a pack of books and bell. At one field we bought a little fire-wool, hired pasture for the animals, and bivouacked in the same field with them. Carrying an iron pot, we cooked and eat our supper under a little tent. Light and lively, each animal carried a pack of books and bell.
KINGSTON.

The obscurity which envelops the earliest history of our most ancient towns is one of the causes which renders the study of topographical antiquities so extremely interesting in this country. Some of the cities and towns of England have existed during eighteen centuries, and the greater part of them, as well as the villages and even hamlets, have been the dwelling-places of successive generations for above a thousand years. But how little we know of the circumstances under which they were first planted! In some cases a few coins, or weapons, or relics of domestic utensils, show that the place had a Roman origin. In others the mere mention of the spot in ancient records is all we know of its earliest existence. How different will be the case in respect to the history of the cities and towns which are now multiplying in every direction in the United States and in British North America! No fabulous story will ever obscure their real origin. A thousand years hence the names of the first builders of the city, the very circumstances under which it was founded, and the records of every important event connected with its rise, will have been handed down with the minuteness of contemporary history. Topography must then be studied in a different spirit. The life of past generations can never cease to be interesting; and as the spirit of investigation will not rest satisfied with dates, it will seek fresh subjects of inquiry in connection with the past.

Kingston, of which we give a view taken soon after it came into the possession of the English, is an ancient settlement, that is, ancient for the New World. Here, in the seventeenth century, the French missionaries established a post, in order that they might be in the midst of the Iroquois. The nature of the position was seen to be so important, that it was soon made use of for more secular purposes, and a large fort with four bastions was erected by the French governor-general of Canada, with a view of commanding the interior. In 1830 there still remained a tower and a triangular building which surmounted one of the bastions, enough to show the strength of the old fort. The missionaries had given the name of Cataraqui to their Christian outpost, but when it was converted into a fortress its name was changed to that of Frontenac, the governor-general under whose orders it was built. Lake Ontario was called after the same person. Now, neither the site of the ancient fort nor that of the grand inland sea bears his name. The former was changed to Kingston when Canada fell into the hands of the British in 1760, and the lake is known by its expressive native name, which signifies the Beautiful Lake. Kingston, which was settled partly by American loyalists after the close of the war of independence, was for some time the capital of Upper Canada, more properly called, since the union of the two provinces, Western Canada. The provincial seat of government was next transferred to York, now called Toronto; but since the union Montreal has been chosen as the chief seat of the executive and legislative bodies for both provinces. Toronto, near the western extremity of Lake Ontario, Kingston on its eastern shores, near where the St. Lawrence opens into the great lake, with Montreal and Quebec, constitute the four most important cities of Eastern and Western Canada. They are each admirably situated for commerce. Quebec is the key of the maritime part of the St. Lawrence; Montreal is the centre of the commerce between Eastern Canada and the United States, and is the seaport of the western province; and Kingston is a most important entrepot between Western Canada and the seaports of Montreal and Quebec. If Lake Huron were united to Ontario by a canal from Toronto, through Lake Simcoe, it would also become the centre of a large trade; and as it is, the flow of emigration west of Lake Ontario has already rendered it a place of extensive business. Quebec is 400 miles from the mouth of the St. Lawrence; Montreal is 180 miles from Quebec; Kingston is 258 miles from Montreal, by the Rideau and Grenville canals; and Toronto is 166 miles from Kingston. But by means of the Welland canal, forty-two miles long, by avoiding the Falls of Niagara, opens an uninterrupted navigation between Lakes Erie and Ontario.

[Kingston, Western Canada.—From a Drawing by Mrs. Simcoe, taken during the First American War.]
The Rideau canal, 135 miles in length, begins at
Kingston, and unites the Ottawa river with Lake
Ontario. There are canals both from Lake Erie and
Ontario which open a direct communication with New
York by the Hudson river. A canal commencing at
Chilicothe, in Ohio, 280 miles south of Cleveland, the
farmer sells his wheat at 2s. 6d. a bushel, and it is
carried by canal to Cleveland, on the south-western
shores of Lake Erie, where, if the price at Chilicothe
be 2s. 6d. the bushel, it is sold at 3s. 6d., and purchased
on account of the merchants of Kingston and Montreal,
at a price of 4s. 6d. a bushel, the bushel originally purchased
for 2s. 6d. is usually disposed of for 3s. 6d. But for the
means of transport the farmer in the centre of Ohio
would be unable to exchange the raw produce of the
soil for articles of luxury and secondary necessity.
South of Chilicothe all the chief products of agriculture
are sent to New Orleans, just in the same way that the
shipping season for the ports of the Black Sea and of the
Atlantic coast of America is passed. The houses extend above
a mile and a quarter within the city, and are visible from
the estuary. A dangerous shoal renders it necessary, to make
a considerable sweep before entering the well-
s calculator than there is to their houses of neatness, order,
and cleanliness most thoroughly as regards
how they had been taught the habits of neatness,
and that they had been brought up: One was of a young
woman who had been taught the habits of neatness,
and was able to occupy inferior tenements, that
their habits soon became "of a piece" with the dwell-
inging instance of the effect of the dwelling itself on
the condition of a female servant when married was
brought to my notice by a member of the family in
which they had been brought up. One was of a young
woman who had been taught the habits of neatness,
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the cottage of a higher condition. The fol-
which affects the health, and causes personal uncleanness,
induced by the difficulty of keeping a clean
and orderly living space. The operation of the same deteriorating in-
fluences were also observable in Scotland, and may be
illustrated by several instances which I have met
with in the course of my own personal inquiries.
One of the circumstances most favourable to the
improvement of the condition of an artisan or an agricul-
tural labourer is his obtaining as a wife a female who
has had a good industrial training in the well-regu-
lated household of six to eight persons. A promi-
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On the north of Lake Ontario, the town, carefully put on, she used to look very comely. After two years, I happened to be walking past one of these miserable cottages, and, as the door was open, I had the curiosity to enter. I found it was the home of the servant I have been describing. But what a change had come over her! Her face was dirty, and her tan

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neglected (except her little child), and she appeared very discontented. She seemed aware of the change there must be in her appearance since I had last seen her, for she immediately began to complain of her house. The wet came in at the door of the only room, and, when it rained, through every part of the roof also, except just over the hearth-stone; large drops fell upon her, and she lay in bed, or as she was working at the window: in short, she had found it impossible to keep things in order, so had gradually ceased to make any exertions. Her condition had been borne down by the condition of the house. Then her husband was dissatisfied with his home and with her; his visits became less frequent, and if he had been a day-labourer, and there had been a beer-shop or a public-house, the preference of the husbandmen would have been inevitable, and in the one instance would have presented an example of a multitude of cases.

She was afterwards, however, removed to a new cottage, which was water-tight, and had some conveniences, and was built close to the road, which her former master and all her friends must constantly pass. She soon resumed, in a great degree, her former good habits, but still there was a little of the dawdle left about her—the remains of the disinterestedness caused by her former very unfavourable circumstances.

Here, as in most other cases, the internal economy of the houses was primarily affected by the defective internal and surrounding drainage. A cottage which was water-tight and no inconvenience caused by the damp and wet, and thereby the dirt, against which the inmates had ceased to contend. On inquiry of the male labourers in the district, it appeared that almost every third man was subjected to rheumatism; and with them it was evident that the prevalence of damp and marsh miasma from the want of drainage, if it did not necessarily, formed a strong temptation to the use of a beer-shop or a public-house, as with the females, the wretched condition of the tenement formed a strong barrier against personal cleanliness and the use of decent clothes.

In the rural districts the very defects of the cottages, which let in the fresh air in spite of all the efforts of the inmates to exclude it, often obviate the effects of the damp and wet, and defective ventilation. It has been observed that, while the labouring population of several districts had had no shelter but huts similar to those described by Dr. Gilli as the habitations of the border peasantry, which afforded a free passage for currents of air, they were not subject to fevers, though they were to rheumatism; but when, through the good intentions of the proprietors, such habitations were provided as were deemed more comfortable from excluding the weather effectually, but which from the neglect of ventilation afforded recesses for stagnating air, and impurities which they had not the means of or had not a sufficient love of cleanliness to remove, though rheumatism was excluded, febrile infection was generated. In the towns the access of the wind is prevented by the height of the surrounding buildings, and the internal construction of the dwellings tends to exclude the air still more effectually. Were the closed windows opened, it would frequently be only to admit a worse compound, the air from neglected privies, and the miasma from the wet and undrained court or street.

The close pent-up air in these abodes has, undoubtedly, a depressing effect on the nervous energies, and this again, with the uneducated, and indeed with many of the educated workpeople, has an effect on the moral habits by acting as a strong and often irresistible provocation to the use of fermented liquors and ardent spirits. Much may be due to the incitement of association of greater numbers of people, but it is a common fact that the same workpeople indulge more in drink when living in the close courts and lanes of the town than when living in the country, and that the residence in the different places is attended with a difference of effects similar to those described in respect to the tailors working in crowded rooms in towns and the tailors working separately or in the country. The uneducated people who live in the close courts strenuously allege the impossibility of avoiding the practice in such places; they do, however, drink in greater quantities in such places, and give increased effect to the noxious miasma by which they are surrounded.

Michaelmas Goose. There is an old custom still in use among us, of having a roast goose to dinner on Michaelmas Day. "Goose-intentos," as Blount tells us, is a word used in Lancashire, where the husbands claim it as a due to have a goose-intentos on the sixteenth Sunday after Pentecost; which custom took origin from the last word of the old church-prayer of that day:--

"Domine, non quæsumus, Domine, gratiasemperpræveniat et sequatur; ac bonis operibus jugiterpræstet esseintentos."

The common people very humorously mistake it for a goose with ten feet. This is by no means satisfactory. Beckwith, in his new edition of the 'Jocular Tenures,' p. 223, says upon it,

"Here, as in most other cases, the internal economy of the houses was primarily affected by the defective internal and surrounding drainage. A cottage which was water-tight and had some conveniences, and was built close to the road, which her former master and all her friends must constantly pass. She soon resumed, in a great degree, her former good habits, but still there was a little of the dawdle left about her—the remains of the disinterestedness caused by her former very unfavourable circumstances."

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Among the old customs in the British Isles is that of sacrificing a goose on Michaelmas Day, which is an immovable feast, the service for that day could very rarely be used at Michaelmas, there does not appear to be the most distant allusion to a goose in the words of that prayer. Probably no reason can be given for this custom but that Michaelmas Day was a great festival, and goose at that time most plentiful. In Denmark, where the harvest is later, every family has a roasted goose for supper on St. Martin's Eve. Among other services (in this country), John de la Hay was bound to render to William Barnaby, lord of Lastre, in the county of Hereford, for a parcel of the demesne lands, one goose fit for the lord's dinner on the Feast of St. Michael the Archangel; and this, as early as the tenth year of King Edward the Fourth, Mr. Douce says,—"I have somewhere seen the following reasons for eating goose on Michaelmas Day, viz. that Queen Elizabeth received the news of the defeat of the Spanish Armada whilst she was eating a goose on Michaelmas Day, and that in commemoration of that event she ever afterwards on that day dined on a goose." But this appears rather to be a strong proof that the custom prevailed even at court in Queen Elizabeth's time. We have just seen that it was in use in the tenth year of King Edward IV. The subsequent shows it to have been in practice in Queen Elizabeth's reign before the event of the Spanish defeat. In the Poines of George Gascoigne, Esq., 4to. 1575, 'Flowers,' p. 40, is the following passage:

"And when the tenants come to pay their quarter's rent, They bring some fowle at Middsummer, a dish of fish in Lent:

At Christmas a capon, at Michaelmas a goose,

And somewhat else at New-yere's tide, for feare their lease rit loose."

A pleasant writer in the periodical paper called 'The World,' No. 10 (if I mistake not, the late Lord Orford), remarking on the effects of the alteration of the style, tells us,—"When the reformation of the calendar was in agitation, to the great disgust of many worthy persons, who urged how great the harmony was in the old establishment between the holidays and their attributes (if I may call them so), and what confusion would follow if Michaelmas Day, for instance, was not to be celebrated by a stable-goose in their highest perfection; it was replied, that such a propriety was merely imaginary, and would be lost of itself, even without any alteration of the calendar by authority; for if the errors in it were suffered to go on, they would, in a very short number of years, produce such a mournful change as could not be mourning for good King Charles on a false 30th of January, at a time when our ancestors used to be tumbling over head and heels in Greenwich Park in honour of Whitsuntide; and at length would be clowing king and queen for Twelfth-night when we should be admiring 'The London Frenches' at Bartholomew Fair." It is a popular saying, "If you eat goose on Michaelmas Day, you will never want money all the year round." Geese are eaten by ploughmen at harvest-home.—Brand's Popular Antiquities, new edit. by Sir H. Elia.
THE PENNY MAGAZINE.

THE BONNET-MONKEY.

Is a native of the Malabar coast, and not of China, as the very objectionable name of Chinese Bonnet, applied to it by Buffon, would seem to indicate. Colonel Sykes informs us that it is called "veanur" by the Marathas, and inhabits the woods of the Western Ghauts in small troops or families. It is probably this species which is exhibited in our menageries as the Bonnet monkey, to which the name of "toque" has been added, a corruption of the word "touque," the toque being a little cap or covering worn by the whole of the native inhabitants of the peninsula of India, and is held in the same veneration in these parts as the Entellus and Rhesus in Bengal and the upper provinces. No species is more commonly brought into England, and exhibited about the streets or in our menageries, than the Toque. It is of a uniform greenish-dun colour on the upper parts of the body; the breast, belly, and inner face of the arms and thighs being light dun or grey, and the face, ears, and hands naked and of a dirty flesh-colour. But the mark which immediately distinguishes the species is a copious and peculiar tuft of long dark hair, which grows from the crown of the head, and spreads round on all sides like rays from a common centre. This hair does not stand erect in the Toque, but lies flatly along the skull, and gives it a diminutive appearance like the scalp of which bald persons sometimes wear on the centre of the crown; and it is the peculiar appearance which it gives the animal that has suggested the name of the Bonnet-Monkey, by which it has long been known.

This animal has been confounded with the cercopithecus pileatus; but British naturalists, in particular, have no more reason than the Chinese for our intimate relations with India bring both species frequently into this country; and we have ourselves seen at least ten living specimens of the cercopithecus pileatus, and probably five times that number of cercopithecus radiatus, in the different British menageries, within the last eight or nine years. Their colour at once distinguishes the two animals: the Toque, or Chinoïd monkey (cercopithecus pileatus), is, as we have already seen, of a greenish-dun colour, and has the long hair on the crown diverging from a common centre, and closely applied to the skull; the cercopithecus pileatus, on the contrary, is of a deep chestnut or rusty-brown colour, with the long hair of the head standing erect like an upright crest; besides which it has a more irascible character, in the rim of the under lip being of a deep black colour, which forms a remarkable contrast with the light tan colour of the surrounding parts, and is alone sufficient to distinguish this animal from all others of the monkey tribe. The foreheads of both species are curiously furrowed with deep transverse wrinkles, which are even more apparent in young than in aged specimens, and give the animals a singularly ludicrous resemblance to an old Indian woman; a resemblance still further increased, in the Toque especially, by the habit of squatting upon its hams and crossing the arms upon its breast or resting them on the knees.

No monkey affords greater amusement in menageries than the Bonnet-Chinois; and the imperturbable gravity with which it accompanies all its actions is truly diverting. When young, it is sufficiently gentle and familiar, and may be instructed to perform every action that monkey genius is capable of aspiring to. It is incessably droll to see these animals, when two or three of them are together, hugging and nursing each other, or kindly performing the offices of affection, and searching through one another's fur, with the most laudable assiduity, for fleas and other vermin. But the penchant of the Toque for nursing is not confined to its own species: when only one of these animals happens to be possessed by a menagerie, a kitten is very frequently given to it as a companion, and nothing can exceed the ridiculous caricature of humanity which it presents,—petting, nursing, and hugging the unfortunate kitten, at the imminent risk of choking it, with all the gravity and fondness that a little child will display in similar circumstances. Thus it will continue for hours together, to the manifest annoyance of the object of its solicitude, who, however, is in no condition to escape from the loving embrace, as the least attempt at resistance on the arbitrary will of the Toque is frowned upon and sometimes severe punishment. We recollect in one instance witnessing a singular and laughable instance of this description. A Bonnet-monkey, exhibited in a travelling caravan, had a cat of considerable size to keep it company in its confinement. Puss, at the moment when our story commences, happening to feel somewhat drowsy, as cats will sometimes do, even in the presence of their betters, had retired to the back and quietest part of the cage, and composed herself to have a comfortable nap. Pug, however, was neither inclined to sleep with himself nor to let any one else do so within his range; he therefore selected a stiff straw and amused himself by poking it up the cat's nose, which, after bearing this annoyance for some time with exemplary stoicism, at length lost all patience and gave her, whilst she was smart scratch on the face with her not very velvet paw. This was more than the offended dignity of the monkey could brook; he seized the unfortunate culprit by the tail, and, flying like lightning to the top of the cage, there held her suspended between heaven and earth, like Mahomet's coffin, and with something worse than the sword of Damocles over her, whilst he inflicted upon her such a series of cuffs and pinches as no doubt warned her in future to be on her good behaviour.

But though, generally speaking, thus gentle and amusing in youth, the Toque is extremely irascible, and ever ready to take offence on the slightest occasion. This is particularly apparent when it is tamed and treated as a pet. For our visitors continue to give, it never refuses to receive; and it is only when the offerings are exhausted that in aged specimens, and ever ready totake offence on the slightest occasion. This is particularly apparent when it is tamed and treated as a pet. For our visitors continue to give, it never refuses to receive; and it is only when the offerings are exhausted that it retires to a corner, and, emptying its reservoirs with the assistance of the bent knuckles pressed upon the outside of the cheeks, devours its contents piecemeal, and is ready to fill them again from the liberality of the next comer.

When adult, the Toque becomes excessively sullen and morose, and the deeply sunk eyes and projecting temporal crests give it a singular air of ferocity which accords but too truly with his natural disposition, and warns the visitor against attempting a familiarity which is not likely to be reciprocated.

Of the Cercopithecus pileatus we have never seen the adult male, nor do we even know the particular locality which the species inhabits. It is most probably, however, that it frequents the forests of Ceylon, and is frequently encountered by Europeans than that of the Toque, since the animal is more rarely brought to England. In youth it resembles the Toque in manners and disposition, but is gentler and less petulant, and in this respect appears to approach the smaller African cercopithecus and semnopithecus. It may possibly be this species which inhabits Ceylon, and which has
given origin to the supposition that the toque, like the wanderoo, is found both in that island and on the continent. We know little of the habits of the toque in its wild state, if it be not the species mentioned by Buchanan in his admirable "Journey through Mysore, Canara, and Malabar," and which he describes as a great nuisance to the gardens and plantations of the natives. "The monkeys and squirrels," says he, "are very destructive, but it is reckoned criminal to kill either of them. They are under the immediate protection of the dáséries, who assemble round any person guilty of this offence, and allow him no rest until he bestows on the animal & funeral that will cost from one to two hundred fanamas, according to the number of dáséries that have assembled. The proprietors of the gardens used formerly to hire a particular class of men, who took these animals in nets, and then by stealth conveyed them into the gardens of some distant village; but as the people there had recourse to the same means of getting rid of them, all parties have become tired of this practice. If any person fried the poor people by killing these mischievous vermin, they would think themselves bound in decency to make a clamour, but inwardly they would be very well pleased; and the government might easily accomplish it by hiring men whose consciences would not suffer by the action, and who might be repaid by a small tax on the proprietors."

Watering Plants.—Watering is the mainstay of horticulture in hot climates. When King Solomon, in the vanity of his mind, made him 'gardens and orchards,' he made him also 'pools of water to water therewith the wood that brings forth trees.' The gardeners of the Toque, or Bonnet-Monkey (Cercopithecus radiaturs), which is highly advantageous, for the Afghans preserve cabbages, carrots, and turnips, as we do potatoes, placing them on the ground, with a little earth over them, and leaves, so that they are thus kept fresh till April. —Burnes's Cabool.

Farming in Afghanistan. — On the prices of farming and labour in Kohistan I gathered the following particulars: — A landlord who farms his estate is understood to pay one-third of the total produce for sowing, rearing, and reaping. The state takes a third, and the remaining third falls to the proprietor. In this case, however, he furnishes the seed, and water for irrigation. If the proprietor also furnishes cattle, and all the materials, &c., which are required, the labourers then receive only one-sixth for their trouble. It is not usual to hire daily labourers, but when a plough, two men, and a pair of oxen are so employed, the wages are half a khan rupee, or three-eighths of a Company's rupee, per diem. Afghanistan is a cheaper country than Persia, for grain is more abundant. Wheat yields from ten to sixteen fold, selim from fifteen; rice, sixteen or eighteen; jowar as much as fifty fold. The best soil in the district of Cabool is at Deh Afghanistan, in the suburbs, where a jureb or land, or half an English acre, produces a rent of ten tomans, or two hundred rupees, and yields, besides the profits of the proprietor, a revenue as high as forty rupees to government; but this is ground on which vegetables are reared, the sale of which is highly advantageous, for the Afghans preserve cabbages, carrots, and turnips, as we do potatoes, placing them on the ground, with a little earth over them, and leaves, so that they are thus kept fresh till April. — Burnes's Cabool.
THE IRISH CLOAK.—No. I.

The cloak has from the earliest times been the prevailing costume of Ireland, and amongst the yeomen and poorer classes maintains its supremacy to the present day. It has outlived much persecution and many hard opinions. Among the latter were those of our famous poet, Edmund Spenser; who, in his 'View of the State of Ireland,' written in 1596, states the case of the mantle or cloak in the following ingenious and eloquent manner. The work is written in a dialogue between Eudoxus and Ireneus:

"Iren. They (the Irish) have another custom from the Scythians, that is, the wearing of mantles, and long glibbs, which is a thick curled bush of hair hanging down over their eyes, and monstrously disguising them; which are both very bad and hurtful.

"Eudox. Do you think that the mantle cometh from the Scythians? I would surely think otherwise; for by that which I have read it appeareth that most nations of the world anciently used the mantle. For the Jews used it, as you may read of Elias's mantle, &c.; the Chaldees also used it, as ye may read in Diodorus; the Egyptians likewise used it, as ye may read in Herodotus, and may be gathered by the description of Berenice, in the Greek commentary upon Callimachus. The Greeks also used it anciently, as it appeareth by Venus's mantle lined with stars, though afterwards they changed the form thereof into their cloaks called Pallia, as some of the Irish also use. And the ancient Latins and Romans used it, as you may read in Virgil, who was a very great antiquary, that Evander, when Æneas came to him at his feast, did entertain and feast him, sitting on the ground and lying on mantles, insomuch as he useth the very word mantle for mantle,

"Iren. They (the Irish) have another custom from the Scythians, and not proper to the Scythians only, as you suppose.

"Iren. I cannot deny but that anciently it was common to most, and yet sithe there was, and laid away. But in this latter age of the world, since the decay of the Roman empire, it was renewed and brought in again by those northern nations, when, breaking out of their cold caves and frozen habitations into the sweet soil of Europe, they brought with them their usual weeds, fit to shield the cold and that continual frost to which they had at home been inured, the which yet they left not off, by reason that they were in perpetual wars with the nations whom they had invaded, but still removing from place to place, carried always with them that weed, as their house,
The cloak now so universally worn by the women of Ireland has supplanted the old Irish mantle only a few years, as in Galway and in Kerry the older and more classic form is still to be met with. Its appearance is similar to the mantilla of the Spaniards, and probably identical with it; there can be no question about the intimate connection in former periods between the two countries, for, independent of the numerous architectural evidences, the fine dark Spanish character of the southern Irish is not to be mistaken for a moment, and contrasts finely with the Celts of the north and west.

But the cloak has no longer the bad moral character attributed to it by Spenser, and every one admits and admires its picturesque character, and the grace with which it is worn. Lady Chatterton, in her very amusing work, 'Rambles in the South of Ireland,' has many passages descriptive of its pleasing effect. She says, for instance, in one, 'The very dress, or rather semidress, of the country-people is picturesque; the large blue cloak worn abroad is held round their well-made figures in folds so easy and beautiful as to furnish excellent models for the artist and sculptor. Their long beautiful hair is generally braided round their small heads with a taste and simplicity truly classic; and there is an ease and grace in all their movements, which seem, I think, to denote a feeling of good taste and refinement far above the common level of their class in other countries.' Many others might be quoted to the same purpose.

The figure at the head of this notice was apparently the daughter of a small farmer, returning from Cork market; the cloak, an exception to the universal blue of this part, was of a dark green, new, and very gracefully worn.

The Wines of the Ionian Islands.—The art of making wine in the Ionian Islands is not so well understood as the cultivation of the vine. Nowhere has it been scientifically and carefully studied. The process is commonly conducted in a rude and careless manner, and the result is as to the quality of wine which is obtained. The grapes are gathered by women and children, and carried in baskets to the press. If the grapes are black, and the skins thick, as they usually are, they are allowed to remain heaped together six or seven days to soften; they are then subjected to the pressure of the feet of men, and next to the more powerful pressure of a screw. The must obtained is fermented for a few days, with the addition of about a fourth of the husks of the black grape, to heighten the

their bed, and their garment; and coming lastly into Ireland, they found there more special use thereof, by reason of the raw cold climate, from whom it is now grown into that general use in which that people now have it. After whom, the Gauls succeeding, yet finding the like necessity of that garment, continued the like use thereof.

This universal adoption makes it very imposing to a stranger; it is often graceful and always highly characteristic; on the women especially it is very striking, as, being without bonnet or shoes, lightly clad, and assisted by the dampness of the climate, it shows off the form like the drapery on a Grecian statue. The Irish cloak is, in general, more ample than that of either Scotland or Wales; though this peculiarity is fast driving away before the tide of British imports, which threatens to annihilate all distinction of costume from 'Indus to the pole.' The Indian in the wilds of Canada, and the tattered fishermen and quartz workers in the isles of the Far West, almost identical with the cast-off coats and trowsers of our soldiers and sailors, and the sweepings of Houndsditch.

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colours. It is then drawn off, and allowed to remain and complete its fermentation in casks. In the instance of white grapes, their skins being sufficiently tender, they do not require to be further softened, and they are subjected to the press without delay. The must is then comminuted, and the treading is provided. The process of which the outline is thus given, is that followed in Zante. It is much the same in the other islands; the variations are incomparable. In most of the islands the greater part of the must is brought into the towns in pig-skins, from whence it is transferred to casks, for the completion of the fermentation. In Santa Maura the must is fermented in pear-shaped vats of masonry lined with mortar. The best wines of the Ionian Islands are those of Ithaca and Cephalonia, and of the hilly and mountainous parts of Zante. They are all sufficiently powerful, and would bear competition, if allowed to have age, I believe they would be approved in this country, especially the red wine of Ithaca, the best white wine of Cephalonia, and the verdes of Zante. The last-mentioned wine is at present made only in small quantities, and with great care; and it is chiefly given in presents by the rich proprietors. It is a highly-flavoured wine, of a greenish hue; it will keep for a great length of time, and continue improving. It is a good instance of what may be effected with care. Unfortunately, in these islands hitherto little or no encouragement has been given to its cultivation. It is a quality—a rapid sale, rather than a just remunerating profit. Much of the wine that is sold is cheaper than small beer; much of it is sold quite new; little is kept a year; none is exported, excepting from one island to another. There are no capitalists—no rich-proprietors; each owner is the merchant; his cellar is the ground-floor of his town-house; having little room—no apparatus—prepossessing that the wine will spoil if kept—he sells it as soon as possible, either by wholesale or retail. If the former, the doors of the cellar are thrown open, the barrels are allowed to stand in the street quite a month, and for a second not a flag of white paper, or of paper stained red, according to the quality of the wine, is hung out on a stick. Should the wine be approved, the cellar is crowded with customers, and suddenly becomes a scene of merriment, uproar, and gambling—filled with talk, talking loud, singing, or playing at cards, or the noisy, vulgar, and classical game of Moro, the micare cuni digitis of the Romans. —_Davy's Malta and the Ionian Islands._

Great Principle of Machinery.—A tool of the simplest construction is a machine; a machine of the most curious construction is only a complicated tool. There are many cases in the arts, and there may be cases in agriculture, in which the human arm and hand, with or without a tool, may do work that no machine can do. There are processes in polishing, wholivesinsodifferenta medium. This fact, when it is true and there is a process in copper-plate printing, in which no significance is perceived, proves that the heat given off to the stance has been found to stand in the place of the human hand. The surrounding medium is restored within the body with great rapidity, and if, therefore, the man with a spade alone does a certain piddling, this compensation takes place more rapidly than in summer. At the equator than at the pole. In the animal body, the food is the fuel; with a proper supply of oxygen we obtain the heat given out during its oxidation or combustion. In winter, when we take exercise in a cold atmosphere, and when, consequently, the amount of inspired oxygen increases, the necessity for food containing carbon and hydrogen increases in the same ratio; and by gratifying the appetite thus excited, we obtain the most efficient protection against the most piercing cold. A starving man is soon frozen to death; and every one knows that the animals of prey in the Arctic regions far exceed in voracity those of the torrid zone. Our clothing is merely an attempt to furnish an equivalent for a certain amount of food. The more warmly we are clothed the less urgent becomes the appetite for food, because the loss of heat by cooling, and consequently the amount of heat to be supplied by the food, is diminished. If we were exposed, like certain savage tribes, or if in hunting or fishing we were exposed to the same degree of cold as the Samoyedes, we should be able with ease to consume 10 lbs. of flesh, and perhaps a dozen of tallow candles into the bargain, daily, as warmly-clad travellers have related with astonishment of these people. We should then, also, be able to take the same quantity of brandy or train-oil without bad effects, because the carbon and hydrogen of these substances would only suffice to keep up the equilibrium between the external temperature and that of our bodies.—_Lubbock's Animal Chemistry._

Results of Machinery.

Means of Maintaining the Uniform Temperatures of the Human Body.—_The most trustworthy observations prove that in all climates, in the temperate zones as well as at the equator or the poles, the temperature of the body in man, and in what are commonly called warm-blooded animals, is invariably the same; and that the loss of heat is in direct proportion to the difference of temperature._

The animal body is a heated mass, which bears the same relation to surrounding objects as any other heated mass. It receives heat when the surrounding objects are hotter, it loses heat when they are colder than itself. We know that the rapidity of cooling increases with the difference between the temperature of the heated body and that of the surrounding medium; that the colder the surrounding medium the shorter the time required for the cooling of the heated body. How unequal, then, must be the loss of heat in a man at Isernia, where the external temperature is nearly equal to that of the body, and in the polar regions, where the external temperature is from 70° to 90° lower.

Yet, notwithstanding this extremely unequal loss of heat, experience has shown that the blood of the inhabitant of the Arctic regions has a temperature as high as that of the blood of the warm-blooded animal who lives in so different a medium. This fact, when its true significance is perceived, proves that the heat given off to the surrounding medium is restored within the body with great rapidity. This compensation takes place more rapidly in winter than in summer, at the equator than at the pole. In the animal body, the food is the fuel; with a proper supply of oxygen we obtain the heat given out during its oxidation or combustion. In winter, when we take exercise in a cold atmosphere, and when, consequently, the amount of inspired oxygen increases, the necessity for food containing carbon and hydrogen increases in the same ratio; and by gratifying the appetite thus excited, we obtain the most efficient protection against the most piercing cold. A starving man is soon frozen to death; and every one knows that the animals of prey in the Arctic regions far exceed in voracity those of the torrid zone. Our clothing is merely an attempt to furnish an equivalent for a certain amount of food. The more warmly we are clothed the less urgent becomes the appetite for food, because the loss of heat by cooling, and consequently the amount of heat to be supplied by the food, is diminished. If we were exposed, like certain savage tribes, or if in hunting or fishing we were exposed to the same degree of cold as the Samoyedes, we should be able with ease to consume 10 lbs. of flesh, and perhaps a dozen of tallow candles into the bargain, daily, as warmly-clad travellers have related with astonishment of these people. We should then, also, be able to take the same quantity of brandy or train-oil without bad effects, because the carbon and hydrogen of these substances would only suffice to keep up the equilibrium between the external temperature and that of our bodies.—_Lubbock's Animal Chemistry._
THE ABBEY OF EVESHAM.

(The from "William Shakspere: a Biography.")

The last great building of the Abbey of Evesham is the only one properly belonging to the monastery which has escaped destruction. The campanile which formed an entrance to the conventual cemetery was commenced by Abbot Lichfield in 1533. In 1539 the good abbot resigned the office which he had held for twenty-six years. His successor was placed in authority for a few months to carry on the work which was enacting through the kingdom, of a voluntary grant and surrender of all the remaining possessions of the religious houses, which preceded the Act of 1539 "for dissolution of abbey." Leland, who visited the place within a year or two after the suppression, "rambling to and fro in this nation, and in making researches into the bowels of antiquity," says, "In the town is no hospital, or other famous foundation, but the late abbey." The destruction must indeed have been rapid. The house and site of the monastery were granted to Philip Hobby, with a remarkable exception; namely, all the bells and lead of the church and belfry. The roof of this magnificent fabric thus went first; and in a few years the walls became a stone-quarry. Fuller, writing about a century afterwards, says of the abbey, "By a long lease it was in the possession of one Mr. Andrews, father and son; whose grandchild, living now at Berkhamstead in Hertfordshire, hath better thriven, by God's blessing on his own industry, than his father and grandfather did with Evesham Abbey; the sale of the stones whereof he imputeth a cause of their ill-success." All was swept away. The abbey-church, with its sixteen altars, and its hundred and sixty-four guided pillars, its chapter-house, its cloisters, its library, refectory, dormitory, buttery, and treasury; its almery, granary, and storehouse; all the various buildings for the service of the church, and for the accommodation of eighty-nine religious inmates and sixty-five servants, were, with a few exceptions, ruins in the time of William Shakspere. Habington, who has left a manuscript "Survey of Worcestershire," written about two centuries ago, says, "Let us but guess what this monastery now dissolved was in former days by the gate-house yet remaining; which, though deformed with age, is as large and stately as any at this time in the kingdom." That gateway has since perished. Of the great mass of the conventual buildings Habington states that nothing was left beyond "a huge deal of rubbish overgrown with grass." One beautiful gateway, however, formerly the entrance to the chapter-house, yet remains even to our day. It admits us to a large garden, now let out in small allotments to poor and industrious inhabitants of Evesham. The change is very striking. The independent possession of a few roods of land may perhaps bestow as much comfort upon the labourers of Evesham as their former dependence upon the conventual buttery. But we cannot doubt that, for a long course of years, the sudden and violent dissolution of that great abbey must have produced incalculable poverty and wretchedness. Its princely revenues were seized upon by the heartless despot, to be applied to his unbridled luxury and his absurd wars. The same process of destruction and appropriation was carried on throughout the country. The church, always a gentle landlord, was succeeded in its possessions by the grasping creatures of the crown; the almshouses of the religious houses was at an end; and then came the age of vagabondage and of poor-laws.

The sense which we justly entertain of the advantages of the Reformation has accustomed us to shut our
eyes to the tremendous evils which must have been produced by the iniquitous spoliations of the days of Henry VIII. and Edward VI. The religious houses, whatever might have been their abuses, were centres of civilization. Leland says, "There was no town at Evesham before the foundation of the abbey." Wherever there was a well-endowed religious house, there was a large and regular expenditure, employing the local industry in the way best calculated to promote the happiness of the population. Under this expenditure, not only did handicrafts flourish, but the arts were encouraged in no considerable degree. The commissioners employed to take surrender of the monasteries in Warwickshire reported of the nunnery of Polsworth, "that in this town were then forty-four tenements, and but one plough, the residue of the inhabitants being artificers, who had their livelihood by this house." In another place Dugdale says, "Nor is it at all observable that, whilst the monasteries stood, there was no act for relief of the poor, so amply did those houses give succour to them that were in want; whereas in the next age, namely, 39th of Elizabeth, no less than eleven bills were brought into the House of Commons for that purpose."* We have little doubt that the judicious encouragement of industry in the immediate neighbourhood of each monastery did a great deal more to render a state provision for the poor unnecessary than the accustomed "succour to those who were in want." The benevolence of the religious houses was systematic and uniform. It was not the ostentatious and improvident almsgiving which would raise up an idle pauper population upon their own lands. The poor, as far as we can judge from the acts of law-makers, did not become a curse to the country, and were not dealt with in the spirit of a detestable severity,

* Dugdale's 'Warwickshire,' p. 800.
† Ibid., p. 803.

[The Parish Churches, Evesham.]
so that if he met a person that he hated, or had him in office, Ghent were inflamed at this act, that they at once wrote from the country, and the position of Flanders was such as to enable its inhabitants to favourably dispose of the prince of Edward I., who had in his attempts on the French throne. Ambassadors were in consequence sent from this country, and favourably received by Jacob Arteveld, who induced the people of Ghent to conclude a treaty of alliance with Edward. Count Louis, then Earl of Flanders, who supported the interests of the King of France, as his suzerain lord, endeavoured to arrest these proceedings by the execution, at Bruges, of one of the men who had been conspicuous in the arrangement of the treaty. The people of Ghent were so inflamed at this act, that they at once marched upon Bruges, and compelled that town to join the alliance; and further, with the assistance of the English, defeated the earl, and compelled him to retreat into France.

In the course of the war that ensued, Arveled endeavoured to draw still closer the connection with the English, by proposing to Edward that Flanders should be erected into a sovereign duchy, with Edward, afterwards known as the Black Prince, at its head. The Flemings, it appears, thought this was going too far; they did not desire to deprive the earl entirely, both in himself and in his heirs, of a rule, and a peaceful and prosperous state, not merely from the stirring character of the leaders, particularly in Philip's case, but from the peculiar origin of the war which sprung from a great jealousy, at Bruges, of one of the men who had been conspicuous in the arrangement of the treaty.

The day, Arveled came into Ghent, about noon; they of the town knew of his coming, and many were assembled together in the street whereas he should pass; and while he entered the town, he began to murmur, and began to run together three heads in one hood, and cried, 'Behold wonder great master, who will order all Flanders after his pleasure; the which is not to be suffered.' Also their words were sown through all the town, how Jacob Arveled had nine years assembled all the revenues of Flanders without any accost given, and thereby had kept his estate, and also sent great riches out of the kingdom into England secretly. These words set them of Ghent on fire; and as he rode through the street he perceived that there was some new matter against him, for he saw such as were wont to make reverence to him as he came by, he saw them turn their backs toward him, and enter into their houses: then he began to doubt; and as soon as he was alighted in his lodging, he closed fast his gates, doors, and windows. This was scarc done but all the street was full of men, and especially of them of the small crafts; there they assailed his house both behind and before, and the house was broken up. He and his within the house defended themselves a long space, and slew and hurt many without; but finally he could not endure, for three parts of the men of the town were at that assault.

When Jacob saw that he was more oppressed, he came to a window, with great humility, bare-headed, and said with fair language, 'Good people, what aileth you? Why be you so sore troubled against me? In what manner have I displeased you? Show me, and I shall make you amends at your pleasures.' Then such as heard him, answered all with one voice. 'We will have accompt made of the great treasure of Flanders that ye have sent out of the way without any tittle of reason.' Then Jacob answered meekly, and said, 'Certainly, sirs, of the treasure of Flanders I never took nothing; withdraw yourselves patiently into your houses, and come again to-morrow in the morning, and I shall make you so good accompt, that of reason

* Lord Berners calls him Jaques Dartnell, and his son Philip Dartnell: we take the liberty of using the more correct and better known appellation.
ye shall be content.' Then they all answered and said, 'Nay, we will have accompt made incontinent; ye shall not escape us so; we know for truth that ye have sent great riches into England without our knowledge, wherefore ye shall die.' When he heard that word, he joined his hands together, and sore weeping, said, 'Sirs, such as I am ye have made me, and ye have sworn to me or (ere) this to defend me against all persons, and not to yield me without my will; ye must not do so, for God's sake take better advice, and remember the time past, and consider the great graces and courtesies that I have done to you; ye would now render to me a small reward for the great goodness that I have done to you and to your town in time past. Ye know right well merchandise was nigh lost in all this country, and by my means it is restored; I have reaching you in great peace and rest, for in the times of my governing ye had all things as ye would wish, corn, riches, and all other merchandise.' Then they all cried with one voice, 'Come down to us, and preach not so high, and give us account of the great trouble of Flanders, that ye have governed so long without an officer to do, as to receive the goods of his lord, or of a country, without accompt.' When Jacob saw that he could not appease them, he drew in his head, and closed his window, and so thought to steal out on the backside into a church that joined to his house; but his house was so broken, that four hundred persons were entered into his house; and finally there was he taken and slain without mercy.

Thirty-six years after this event, the Ghentenses found themselves once more in active warfare with their prince, Louis II., a son of Jacob Arteveld's sovereign and chief antagonist. But his cause was beginning to look gloomy. The earl had succeeded in completely surrounding the city at a certain distance, so as to prevent any supplies of provisions from reaching the unfortunate inhabitants. Their distress at last grew unsupportable, and Van den Bosch and the other leaders were scarcely able to keep the inhabitants firm to their purpose of continuing the war or obtaining an honourable peace. It is a curious and most striking evidence of Jacob Arteveld's talents and honesty that he could consider it as his duty to suffer to the mind of his fellow-townsmen, disgraceful to them as was the act by which they had lost his services; and further, that their recollections of him should have so worked upon their minds in the present extremity, that a comparatively unknown man should be suddenly called forth from his obscurity to lead them, simply from his connection with the lamented Arteveld. But so it was, and the character and actions of the man thus summoned to their aid give to the whole incident more an air of a romance than a sober history.

Peter den Bosch, at his wit's end on account of the difficulties to which we have referred, at last made a bold and novel stroke to relieve himself. Jacob Arteveld had joined his hands together, and so weeping, said, 'I who was abiding in my mother's house' in retirement, and living with her 'honestly on their rents.' One evening Peter den Bosch suddenly appeared before Philip Arteveld, and began to open the matter wherefore he was come to him, and said thus:—'Philip, if ye will take good heed to my words, and believe my counsel, I will make you the greatest man in all the country of Flanders.' 'How can that be, Sir?' said Philip. 'I shall show you,' said Peter; 'ye shall have the governing and ministration of all them in the town of Ghent, for we be now in great necessity to have a sovereign captain of good name and of good renown, and so by this means your father, Jacob Arteveld, shall rise again in this town, by the remembrance of you; for every man saith that since his days the country of Flanders hath not been so loved, honoured, nor feared, as it was while he lived; and I shall lightly set you in his stead, if ye list yourself; and when ye be in that authority, then shall ye govern yourself by my counsel, till ye have full understanding of every case, the which ye shall soon learn.' Then this Philip, who had been always a schemer and naturally had a head above all, answered and said, 'Peter den Bosch, ye offer me a great thing, and I believe you; and if I were in the state that ye speak of, I swear to you by my faith that I should do nothing without your counsel.' Then Peter answered and said, 'How say you? Can ye bear yourself high and be cruel among the commons, and ye say ye speak of such things as we shall have to do? A man is nothing worth without he be feared, doubted, and some time renowned with cruelty; thus must the Flemings be governed; a man must set no more by the life of men, nor have no more pity thereof, than of the lives of swallows or larks, the which be taken in season to eat.' By my faith,' said Philip, 'all this I will do. Ye shall then see how right we are, and who may be appointed to an officer to do, as to receive the goods of his lord, or of a country, without accompt.'

Then Philip Arteveld was christened, and set all the people as wasthe act by which they had lost his said, 'Sirs, it is Philip Arteveld, who was christened, and I shall make you so that ye shall be sovereign above all other;' and so therewith took leave of him and departed. The night passed, the next day came; then Peter den Bosch came into a place whereas there were assembled more than four thousand of his sect (party) and others, to hear some tidings, and to know what they should be ordered; but he was so say; ye speak of such things as we shall have to do? A man is nothing worth without he be feared, doubted, and some time renowned with cruelty; thus must the Flemings be governed; a man must set no more by the life of men, nor have no more pity thereof, than of the lives of swallows or larks, the which be taken in season to eat.' By my faith,' said Philip, 'all this I will do. Ye shall then see how right we are, and who may be appointed to an officer to do, as to receive the goods of his lord, or of a country, without accompt.'

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THE EGYPTIAN THEBES.

The name of No occurs several times in the Holy Scriptures as that of a great and populous Egyptian city; and is sometimes distinguished by the addition of the word 'Amon' (No-Amon). This addition would naturally suggest that the city denoted was the chief seat of the worship of Jupiter Ammon; and this was the identical city, the Scriptorial rendering it by 'Diospolis,' which was a name of Thebes, on account of its devotion to the worship of Jupiter. It is true that there were two other cities in Egypt which bore the same name; but as Thebes was the principal, and other circumstances concur in its favour, we have little hesitation in acquiescing in the general conclusion that this famous city is intended by the No of Scripture.

Thebes has been celebrated as the most ancient capital and renowned city of Egypt, the origin of which is lost in the remote infancy of human settlements and institutions. Long the metropolis of the country, and continuing, as the independent capital of Upper Egypt, to eclipse the metropolitan cities which arose in Middle and Lower Egypt—enriched by commerce, devotion, and the spoil of conquered kings—and always looked to with veneration as the parent city, and the prime seat of the sacred mysteries, and of learning and the arts.—Thebes survived in splendour and magnificence long after Memphis had become the political metropolis of the united kingdom, and, from its more advantageous situation for trade, had diverted from it the wealth it could command. This, however, doubtless gave the first impulse to its decline; but from the reports of ancient writers it may well be questioned whether, at any point of time which the Old Testament history embraces, the subtraction which the rivalry of Memphis made from the wealth and population of Thebes enabled her to eclipse, or even equal, the remaining glory of that most renowned city. And even at this day, while Noph, and Zoan, and On have scarcely left a trace of their existence, the desolate temples of Thebes, which remain fresh, fair, and strong, promise to carry down to future ages the record of her glory and desolation.

Thebes has the distinction of being mentioned by Homer, who speaks of its great wealth, and mentions its hundred gates, from each of which issued two hundred men, probably for the defence of the city, on pressing occasions. This passage has occasioned more discussion than a poetical allusion appears to require. Diodorus seems to intimate that this force was not raised in the immediate vicinity of Thebes; and as to the hundred gates, he states the conjecture of some persons, that the city derived its title of Hecatompylos from the numerous propyla, or gateways of temples and public buildings. Some understand it to denote so many palaces of princes, each of whom, on pressing occasions, furnished the stated number of men, horses, and chariots. A strong objection to the notion that city-gates can be intended, arises from the fact, as noticed by Pococke, Wilkinson, and others, that not the least indication can be discovered that Thebes was ever inclosed by a wall. We have no detailed descriptions of the city from ancient sources, but only of the conspicuous public monuments; and it is very possible that, in this and other ancient cities of Egypt, while the temples seem adapted, from their massive character, and durable materials, to resist the utmost power of time, the mass of the private dwellings were of a very humble character, plated with mud or brick; and the houses were of wood, but this would be hardly possible in Egypt, where timber is, and ever has been, scarce and costly. But it is now well apprehended that, in speaking of the splendour of ancient cities, we understand exclusively their public buildings and monuments, and nothing of handsome streets and comfortable abodes, in which our modern cities as far exceed the ancient as the ancient probably exceeded ours in temples, theatres, palaces, and tombs. However, the very complete information obtained from the painted walls and tombs at Thebes, concerning the usages in peace and war, the arts, the costumes, and the manner of life and action of the ten thousand inhabitants, furnishes a satisfactory and most authentic corroboration of the ancient accounts of their luxury and wealth. Of the latter, some idea may be formed from the accounts of the spoil obtained by the Persians, under Cambyses, and the quantity of precious metal collected after the burning of the city, which last, according to Diodorus, amounted to upwards of 300 talents (about 27,029 pounds Or gold) and 270 talents (or 199,518 pounds of silver); the former worth 1,248,960l. sterling, and the latter 508,544l. This great conflagration is said not only to have destroyed the private houses, but the greater part of the numerous temples by which Thebes was adorned. This is however not the first time that Thebes had suffered from the sweep of war. In the spoils of Nineveh, and which appears to correspond to the first direct blow which the splendour of Thebes received on the invasion of Egypt by the Ethiopians, B.C. 759. Between this and the invasion of Cambyses, it probably again suffered in the incursion of Nebuchadnezzar; and after it was burnt by the Persian king we cease to hear of its greatness from causes of a different nature; but it still survived and was held in high consideration, and something seems to have been done towards its restoration; and B.C. 86, it was still of such strength and consequence as to dare to rebel against Ptolemy Lathyrus, and stood a three years' siege before it was taken and plundered. Perhaps this fact may be set in opposition to the opinions already stated, that Thebes was never walled; for it was not, it is difficult to understand how it could have held out so long. Under the Romans, some small buildings seem to have been erected for the convenience of their local establishments; but it was again punished for rebellion by Gallus, in the reign of Augustus; and from that time we hear no more of it as a living town. Strabo describes it as ruined, the only buildings being collected (as at present) in a few hamlets constructed on its site. The zeal of the early Christians against the forms of outrageus idolatry there displayed, led them to do their best to deface and destroy its remaining monuments. Thus was Thebes at last reduced to a desolation—but perhaps the grandest destruction in the world—by a succession of destructions and spoliations which were foretold by the inspired prophets, whose predictions were, in their day, derided and laughed to scorn. And here we may pause. The temples, obelisks, statues, and tombs of Thebes offer a wide field for description. But as these do not directly tend to Scriptural illustration, and could not be satisfactorily examined within the limits of a note, it seems best to avoid the subject altogether. There is however one point in which we feel too much interest not to allude to it. Thebes has again in our own day risen to an importance peculiarly its own, and which has drawn towards it the strong attention of all Europe. This arises not only from the peculiar character of its monuments, and the facility of access to them, but from the fact that, the paintings and sculptures which decorate the walls of its temples and the interior of its long-hidden tombs, furnish a vast mine of information, of the most authentic and intelligible kind, concerning the manners, usages, and habits of remote times, which might elsewhere be sought in vain, and which has long been vainly desired.
THE BIRCH

COLERIDGE conferred upon the birch the title of the "Lady of the Woods," and every one will acknowledge that its elegance, grace, and beauty entitle it to the poet's appellation. Nothing can be more light and airy than its slender drooping spray, "circling like a fountain-shower," as another poet sings, those who sit beneath its branches. The birch needs not a rich soil and sheltered situation, but is often employed as a "nurse" to less hardy trees, and flourishes on poor sands on which only the pine and larch besides itself can manage to thrive. It fears not the bleakest storms, but grows at a higher elevation than any other of our indigenous trees. Mr. Selby, in his very elegant work on "British Forest-Trees," says that in Scotland the birch grows at an altitude of three thousand five hundred feet. The species is very widely diffused in the temperate regions of the globe, but its true habitat is indicated by the appearance which it presents in different situations. Towards the southern limits of the zone which it occupies, in the Apennines for example, it is first found at an elevation of four thousand seven hundred and sixty feet. On Ætna it is found at about the same elevation. In Lapland it grows within about two thousand feet of the line of perpetual snow, and eight hundred feet higher than the pines, but in this situation it shrinks into a bush, and in the highest regions of the Lapland Alps it "creeps upon the ground." It is true that there are many exceptions to the theory which assigns the zones at which different trees cease to grow. Mr. Laing, in his work on "Norway," mentions that on the Dovre Fjelde, in latitude about 62° 25' north, and at an elevation exceeding three thousand feet, the birch is growing up the sides of the hills with abundance sufficient to afford firewood to two farms. These trees, he says, are stunted and crooked, but "they are more luxuriant than those growing in the most sheltered spots in the county of Caithness, in latitude 58° north, and only a few feet above the level of the sea." That the birch does grow at a higher elevation than any other tree is beyond a doubt. None
like it braves so well the inhospitalities of climate: it
cheers the ever-desolate scene in spite of the wild and
bitter winds and piercing northern blasts, and man
should look upon it with a friendly eye. In the milder
parts of Sweden and Norway, and in Russia, the birch
is the most common tree, after the pine. In the latter
country whole forests are covered with it alone, and it
attains a height of seventy feet, and two feet in dia-
meter; but in England it does not acquire such large
dimensions. In Scotland, on the shores of lochs, on
the banks of rivers, and in mountain scenery, the birch
constitutes one of the most beautiful features of the
landscape. It emits an agreeable fragrance, especially
in the spring, or at other periods after showers, and
slightly at all times while in leaf.

There are four species of birch found in Europe.
The common birch and the weeping birch are the best
known. The most striking difference between the two
is indicated by the title of the latter, which is by far
the most ornamental tree, and is the one which is general
in Scotland and also in Wales. Besides its character
being indicated by its pendulous branches, it may be
distinguished by the young shoots being quite smooth,
but with little whitewarts. Sir T. Dick Lauder gives a
rule for ascertaining this species when young. He
says "that in young weeping-birches there is a certain
degree of roughness on the spray, as if it were the coa-
gulation of a gum exuded from the pores, that never
failed to indicate to us the tree which was ultimately
to furnish us with pendulous branches." Some natural-
ist do not call the weeping-birch a variety, but a varia-
tion; but it appears to have a tolerably distinct char-
acter, and besides the differences already pointed out,
it grows more rapidly and attains a larger size than the
erect or common species. The dwarf-birch is found
in the northern verge of the zone inhabited by the
birches. Linnæus, in his "Tour in Lapland," says that:
"it furnishes the inhabitants of the mountainous parts
of Lapland with fuel. In Tierra del Fuego there is also
a species of birch which does not exceed the size of a
shrub. The common birch is subject to a curious dis-
case, which displays itself in a manner with which most
persons are familiar—the matting together of the small
twigs so as to look like a bird's nest. This symptom
indicates that the tree is placed in an unfavourable
soil or situation.

Several of the birches which grow in the mountainous
parts of India are noble trees, and are valued for their
timber in the places where they grow. The bark of
the Indian paper-birch is of a cinnamon colour, and its
laminæ are used as a lining for hookahs. The Sanscrit
name for this substance is boorja, a word which is re-
ferred to with many others in proof of the Teutonic
languages having descended from the Sanscrit. The
American birches contain several interesting varieties,
some of which have been introduced into this country.
The paper or canoe birch furnishes the bark of
which canoes are constructed. The bark is the part of
the tree most valued. Log-houses are sometimes
thatched with it, and even hats are sometimes manu-
factured from it. Michaux describes the manner in
which the bark is obtained when wanted for a canoe.
The largest and smoothest trees are selected, and in the
spring two circular incisions are made in the trunk, at
the distance of several feet apart, with longitudinal
incisions on each side. The bark is easily detached by
means of a wooden wedge. With thread made from
the fibrous root of the white spruce fir, the pieces of
bark are sown together, over a light framework of
wood, and the seams are caulked with the resin of the
Balm-of-Gilead fir. A canoe of this kind, capable of
carrying four persons and some baggage, weighs
from forty to fifty pounds only. The American red

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bark grows in the southern states of the Union,
and attains a height of seventy feet and a diameter of
from two to three feet. Its bark is brown, dotted with
white and slightly wrinkled. The brooms used in the
streets of Philadelphia, which are said to be far better
than those of Europe, are made from the tough
and elastic twigs of this species; and when about an
inch thick they are also used for cask hoops. The
cherry-birch, sometimes called the mountain mahogany,
on account of its excellent timber, which is hard, close-
gained, and of a dull reddish colour, is deserving of
the attention of planters in this country, and would
probably be very successful in our climate. South of
Pennsylvania it flourishes only on the Alleghilies.

The yellow birch, so called from the bright golden
yellow of its bark, is found chiefly in the coldest
corners of North America, and is scarcely seen south of
the Hudson.

The birch is at present as little regarded in England
for its utility as in the days of Evelyn; but perhaps it
has been under-rated. Mr. Selby, in the work already
quoted, offers some good reasons why its cultivation
would be more advantageous than several other trees
in greater esteem. Mr. Hooker, in his "Flora of
broad-leafed plants," says: "A vast quantity of birch timber is annually

used for the staves of herring-barrels; and indeed
this is the principal use to which it is now applied in
the north of England and Scotland, except in some parts
of the Highlands, where it is still the timber used in
the construction of houses, and where not only the
gutter part of the house, but also the agricultural implements are made of it." It is also
much used, together with the elder, for the soles of the
clogs or wooden shoes frequently worn in the north of
England and in Scotland. For the above-mentioned
purposes the birch attains a sufficient size in fifteen or
twenty years, whereas other trees would require a
much longer period; and if some of the exotic birches
which are more rapid in their growth were extensively
planted, the proprietor would probably raise a very
handsome rent from the soil. In England birch is
generally treated as coppice or underwood. At the
end of five or six years it is cut down for brooms, and
if allowed to stand twice this period it becomes useful
for fuel, poles, stakes, and fencing. Birch bark sells
for about half as much as that of the oak. The timber
is coarse-grained, and when dried it is readily
imported from Russia and America, and is used
in various articles of manufacture. The birch makes
superior charcoal, and is extensively used in the
manufacture of gunpowder, and as a crayon for artists.

The extensive usefulness of the birch in the northern
parts of Europe is deserving of a separate paragraph.
In some of the most inhospitable parts of Europe it is
the only fuel. In Sweden it is the fuel best adapted
for smelting of iron. Mr. Laing says that the bark
"is used all over Norway, beneath slates, tiles, earth, or
whatever may be the exterior covering of a roof, to
prevent the wood beneath from rotting. All posts
which are in contact with the earth, whether forming
fences, bridge-rails, or gates, are always carefully
wrapped round with birch bark. Milk is kept in a
bark firkin for a few inches above and below the ground." The oily nature
of the bark enables it to resist wet, and prevents its
decay. Instances have occurred in which a fallen
tree has crumbled into dust, while the preservation
of the bark has been so perfect as to preclude suspicion
as to the ravages which it concealed. The bark has
also resisted petrifaction, while the process had been
complete within. According to Captain Brooke, the bark is used frequently
"as an inner sole for shoes, and for this purpose seems preferable to leath-
er." The Laplanders make waterproof boots and
shoes of it, and a piece with a hole in the centre forms
a fashionable 'Mackintosh' amongst them. Mr. Laing also speaks of the "curious saving of ropes by birch poles." They are rigged with shrouds in small vessels, and employed as traces in horse-harness. The bark is made into cordage in various ways. The leaves serve as fodder for cattle in Norway and Sweden; and in Finland as tea. The bark is used for tanning by a very simple application, described in Linnaeus's 'Tour in Lapland' (vol. i., p. 130). The peculiar odour of Russian leather is derived from an oil distilled from birch bark which is used in the tanning process. The inner bark is reddish, and this gives the deep red colour to the sails of the fishing-boats and to the fisherman's nets on the shores of Norway. A yellow dye is obtained from the leaves and young shoots. A pleasant beverage is obtained from the birch by tapping the tree for its sap in the spring. The manufacture of this wine was an affair of some interest to the good housewives of England two or three centuries ago, and Evelyn gives a diffuse account of the process.

RAILWAY GOODS-TRAFFIC.

(Continued from page 395.)

We stated in the last article that Pickford's Railway Depôt is a scene of activity and bustle—not during the day, but in the night time. The cause of this rather unusual circumstance is to be found in the hours which the Railway Company have fixed for the departure of the goods-trains, and which are regulated so that the trains arrive at Camden Town (where the peculiar odour of Russia leather is derived from an oil distilled from birch bark) which is used in the tanning process. The inner bark is reddish, and this gives the deep red colour to the sails of the fishing-boats and to the fisherman's nets on the shores of Norway. A yellow dye is obtained from the leaves and young shoots. A pleasant beverage is obtained from the birch by tapping the tree for its sap in the spring. The manufacture of this wine was an affair of some interest to the good housewives of England two or three centuries ago, and Evelyn gives a diffuse account of the process.

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which arrives at a later hour. In this case usually
about ten or twelve trucks are laden with goods for
Pickford and Co., which go through the same process.
Meanwhile much has been doing in the preparation
of the ‘down’ trains, which we must now notice. All
the goods dispatched hence towards the north have been laden by other carriers. At six in the morn-
ing the first train leaves, and by this train part of
the laden trucks are conveyed; while the remainder are
dispatched in other trains two or three hours afterwards.

On their arrival at the various stations and termini,
the goods are delivered to the carriers’ servants, who
in like manner receive the trucks which have been laden by other carriers. At six in the morn-
ing the first train leaves, and by this train part of
the laden trucks are conveyed; while the remainder are
dispatched in other trains two or three hours afterwards.

As the trucks are filled and covered, they are wheeled
out of the warehouse, upon the small railway which con-
nects Messrs. Pickford’s premises with the Company’s
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RAILWAY RAMBLES.

MOOR PARK.

Continuing along the same road as that we pursued on our last ramble to Cassiobury, and passing the lodge of the latter, a delightful walk of two or three miles brings us to the little country-looking town of Rickmansworth, from whence Moor Park is but a mile or so distant. One of the most rural of lanes or bye-roads conducts us to an entrance into the park, which is famous for its woods and for the undulating varied character of its surface. Before we have stepped many paces a sight breaks upon us that is truly beautiful. On the grassy slope rising on our right, and scarcely fifty yards from us, a herd of deer is grazing, with the light falling on their fair, sleek, and dappled coats. As we pause to gaze upon them, one rises here, another there, tossing their lofty antlers with a proud disdain, and walking slowly away; whilst others, apparently satisfied of the innocence of our intentions, return our glance in a sense of quiet security. As we draw nearer the house, we get a first view of it over a terrace wall decorated with vases, and presently the half-architectural end of the conservatory appears; we then turn the corner, and the building, with its stately and most imposing-looking portico, is before us. The latter consists of four immense columns, rising, with their bases and Corinthian capitals, nearly 50 feet, of a proportionable breadth, and supporting a pediment enriched in the same style. Around the top of the building is a rich cornice, and a still more noticeable feature, a large open balustrade, beautifully relieved as we now look up against the clear blue sky. The house was originally built of brick by the unfortunate Duke of Monmouth, but when it came into the possession of B. H. Stiles, Esq., a gentleman who amassed a splendid fortune by the South Sea scheme, the whole was cased, as we now see it, with Portland stone, the portico added, and also

two wings, one for the chapel, and the other for offices, connected with the centre by colonnades of the Tuscan order. The architect was the Italian Giacomo Leoni.

The expense of the mere carriage of the stone used in these alterations and additions amounted to nearly 14,000L. The wings are now gone (although the conservative forms a kind of wing projecting at right angles from the line of the house, at a few yards distance); for during the period Mr. Rous, a director of the East India Company, was the owner of the property, that gentleman having thrown up his directorship in the expectation of obtaining a place at the Board of Control under Mr. Fox's famous India bill, and being disappointed, eked out an insufficient fortune by disposing of the wings for the value of the materials.

Let us now ascend the steps of the portico, and enter the hall. This is a place of surpassing grandeur in the peculiar style which prevails through it, though the style itself is not one deserving of much admiration. The hall is square, very large, and profuse to an excess has been the expenditure on its decoration. Immense paintings, large compositions in a kind of stucco, military trophies, &c., and solid white marble doorways, no less than five in number, and with double sculptured figures of some size over the pediments, emblematical of Prudence and Piety, Pastoral and Civil Life, Plenty and Victory, Peace and Concord, Wisdom and Power,—these are the chief ornaments of the lower portion of the walls; above projects a gallery all round, with gilt railings, behind which we see five more solid white marble doorways, a range of imitation statues in imitation niches; and lastly the ceiling is one mass of paint and gilding, divided into compartments, the centre containing a painted imitation of the dome of St. Peter's at Rome.

But not all this rich and elaborate display can hide the poverty of the architecture; the airy lightness and varying combination of forms in which are altogether wanting in the hall of Moor Park. But such was the
architecture of the last century. The chief pictures are those which decorate the three sides of the wall, forming a series illustrative of the story of Io from Ovid's Metamorphoses. In the first picture Jupiter is entertaining Io to listen to his suit, whilst a rough-looking Cupid stands leaning on his bow, looking on:

"Her, just returning from her father's brook,
Jove had beheld with a desiring look," &c.

In the second Io appears transformed into a beautiful white heifer, placed by the jealous Juno under the care of Argus, whilst Mercury, commissioned by Jove to kill Argus and set free Io, is trying to lull the former to sleep by music. Mercury leans gracefully against a tree, and Argus, sitting, bends eagerly forward to listen to his "sweet pippings."

"With pleasure, the musician Argus heeds;
But wonders much at those new vocal reeds.
While Hermes piped and sung and told his tale,
The keeper's winking eyes begin to fail,
And drowsy slumber in his lids to creep.
Till all the watchman was at length asleep."

In the third picture we see Argus with his head dropped on the rock, and Mercury in the act of unsheathing his sword, whilst Jove looks very complacently from the clouds above. Mercury

"Without delay his crooked falchion drew,
And at one fatal stroke the keeper slew,
And all his hundred eyes, with all their light,
Are closed at once in one perpetual night."}

We may observe by the way, that although the poet speaks of the hundred eyes, the painter, in despair of representing any such monster, has contented himself with representing Argus with the good old-fashioned number of two only. In the last picture we see no more of Io, but are introduced to a kind of apotheosis of Argus. Juno, seated on a throne of clouds, receives from Mercury the head of her faithful but unfortunate servant, and, to commemorate his history and watchfulness, preserves the memory of his eyes in connection with her favourite bird:

"These Juno takes, that they no more may fail,
And spreads them in her peacock's gaudy tail:"

all which is duly represented in the picture. "These paintings," observes the author of the account of Moor Park, in the ' Beauties of England and Wales,' whose opinion we prefer giving to that of our own, "are in general well executed; and the circumstances of the story are treated with propriety and judgment. The colouring is chaste, but not brilliant: the artist is unknown. The last remark is hardly correct. In a little manuscript account of Moor Park, kept in the hall, and of course prepared under the inspection of those best qualified to judge of the correctness of such matters, the paintings are "supposed" to be by an Italian artist of the name of Amiconi. Among the curiosities of the hall are two tall Chinese pagoda towers of porcelain, an antique chair, and a saddle said to have belonged to Cardinal Wolsey, one of the former possessors of the place.

Passing through the centre doorway of the opposite wall, we reach the saloon, where are the works painted by Sir James Thornhill, for which that artist brought an action-at-law and obtained a verdict of 3500l. On the ceiling is an immense painting of Aurora, copied from Guido's in the Respiigliaripalace, whilst four paintings of the Seasons adorn the walls. On the whole the saloon has a gaudy and heavy appearance, over which the eye passes without the possibility of relief or repose. Where the walls are not covered with the paintings, they exhibit dark grounds, garish or profuse gildings. On a table here are two more pagoda towers, but much smaller, and formed of rice. From the saloon we pass to the grand staircase, where the first thing that meets the eye is a row of three Chinese painted figures that size of life, with, as our attendant carefully informs us, nodding heads. These Chinese curiosities are probably some of the memorials of a famous voyage, and a famous man, another of the former possessors of Moor Park, Lord Anson, the great navigator, to whom we shall have occasion again to recur. Except in the matter of the paintings on the walls, the staircase, by contrast with the richly gilded hall, looks as though the decorators were getting dissatisfied with the great expenditure involved, and had stopped short here. These paintings too chiefly form a series, illustrative of one of the fables of antiquity as told in the pages of the same Roman poet, the fable of Pluto and Proserpine.

Among the other interesting rooms of the building may be mentioned the dining-room with its stucco ceiling and figures, and deep-coved cornice, its two or three small but good pictures, and its charming views into the park; the blue drawing-room; a bed-room with a curious Chinese painting on the back of the glass, which is silvered over like a mirror; her ladyship's morning-room with a rich little Holy Family; and the drawing-room, a superb apartment, and in fancy, in infinitely better taste than any of the parts we have quitted. It is long, moderately broad, and sufficiently lofty; on one side a range of windows opens upon the noble park, where you look over beds of flowers in full bloom, and through long vistas of green trees, to the distant hills, now bathed in purple mist, and above is a very beautiful ceiling in compartments, where the little groups and single figures from the antique are not only in themselves beautiful, but form a delightful relief to the more pretending works we have recently noticed. They are set in a most delicate frame-work of scroll ornaments in painting and gold, which run over the whole ceiling in endless variety. The chimney-piece here is a striking object. It is supported by two full-length figures, having rock-work, coral, &c., in their hands, and along the front at the
top is a row of small figures dancing hand in hand, relieved by the rich blue colour which forms the background, the only colour about the work, the remainder consisting entirely of white marble of the most brilliant and increased kind.

Leaving the house, we proceed to view the greatest attraction of Moor Park, the beautiful pleasure-grounds, which occupy not less than twenty-five acres, and have some interesting history attached to them. But as this history connects itself with different possessors of the mansion and grounds, we may here pause to notice what has been recorded of any moment concerning both.

[To be continued.]

ON THE LOCAL WINDS OF WARM COUNTRIES.

In nearly all countries lying within or contiguous to the tropical regions, local winds are occasionally experienced, to which, as agents producing very marked effects, the natives are accustomed to affix particular names. Such are the sirocco, the solano, the khamsin, the sirocco, the harmattan, &c. The nature of these winds cannot be well understood unless we contrast them with the great trade-wind, from which all are more or less exceptions. The cool air of the polar and temperate regions has a tendency to flow towards the equator, to supply the place of that which is expanded and rarefied by the heat of the tropics; so that there is always a vertical ascent of air at the equator, and a lateral flow thereto from the poles. An inhabitant at the equator would hence experience most constant north and south winds. But as the earth is rotating on its axis, and as the particles of air cannot at once acquire a velocity equal to that of the parts of the earth's surface over which they successively arrive in their transit, the northern and southern currents will gradually seem to acquire a motion in an opposite direction to that of the rotation of the earth; that is, both will gradually decline to the west, assuming in the northern hemisphere the character of a N.E., and in the southern that of a S.E. wind; whilst both will become more easterly as they approach the equator. From the facilities which these winds afford to navigation, they are called the trade-winds; and a modification of them in the Indian Ocean produces the monsoon, or alternate dry and rainy winds, which are either hot and dry, or hot and moist, which generally result from the local position and physical character of a country, the sirocco is one of the few experienced in Europe. It occurs in the islands and coasts in the Mediterranean, such as Italy, Sicily, and the Ionian Islands. The sirocco is generally felt in these places when the wind comes from S.E. or S.S.E., and its approach is known by the peculiar sensations felt throughout the animal system; there is a general lassitude or torpor of the muscular system, attended by heaviness and oppression, inducing an inaptitude to any exertion, either mental or corporeal; everything that is touched is damp and clammy, particularly the clothes, which feel as if they had been wrung out of water; the appetite is impaired, thirst increased, and perspiration from the two latter sometimes only by the second; there is a sensation of burning heat in the chest. Independent of these effects in the animal system, Mr. Montgomery Martin* gives many curious examples of other results produced by this wind. The walls of houses, stone-floor, and pavements, invariably become moist when the sirocco blows; and yet vegetables appear as if shrivelled up for want of moisture. Wine bottled during a sirocco is greatly injured and often destroyed, and meat becomes tainted very quickly. No carpenter uses glue during the sirocco, for it does not adhere; nor will a painter willingly work at this time, for the paint will not dry, or if apparently dried by a subsequent dry wind, the wet paint oozes out. Bakers diminish the quantity of their leaven at this period, as dough is found to ferment sufficiently without it. Dr. Hennen * remarks, in reference to the action of the sirocco on man, "I have scarcely ever met an individual who was not more or less sensible to these effects; history connect itself with different possessors of the same who have felt them but slightly on their first arrival, have become agreeable to them during some time; many can foretell the approach of a sirocco some time before it begins to blow, by the peculiarity of their feelings; and there are few indeed who cannot at once decide that this wind has commenced, without making any reference to external objects: but it is by the sick and the weakly convalescent that its depressing effects are most severely experienced."

Nearly allied to the sirocco of Italy is the solano of Spain. It is dreaded by the Spaniards, who have a proverb that "no animal, except a pig and an Englishman, are insensible to the solano." Englishmen, however, must not be included in this exception; for the officers and troops at Gibraltar frequently suffer from its effects. After the attack on Algiers in 1816, the wounded English seamen were taken to Gibraltar; but before they reached there, a solano sprang up. A temporary hospital had been fitted up on the main deck of one of the ships, and all was going on well till the dreaded wind was felt, when all the invalids were affected in an extraordinary manner; the dressed wounds opened, bilious remittent fevers came on, and Dr. Quarrier, the surgeon of the fleet, was; in nearly all countries lying within or contiguous to the tropical regions, local winds are occasionally experienced, to which, as agents producing very marked effects, the natives are accustomed to affix particular names. Such are the sirocco, the solano, the khamsin, the sirocco, the harmattan, &c. The nature of these winds cannot be well understood unless we contrast them with the great trade-wind, from which all are more or less exceptions. The cool air of the polar and temperate regions has a tendency to flow towards the equator, to supply the place of that which is expanded and rarefied by the heat of the tropics; so that there is always a vertical ascent of air at the equator, and a lateral flow thereto from the poles. An inhabitant at the equator would hence experience most constant north and south winds. But as the earth is rotating on its axis, and as the particles of air cannot at once acquire a velocity equal to that of the parts of the earth's surface over which they successively arrive in their transit, the northern and southern currents will gradually seem to acquire a motion in an opposite direction to that of the rotation of the earth; that is, both will gradually decline to the west, assuming in the northern hemisphere the character of a N.E., and in the southern that of a S.E. wind; whilst both will become more easterly as they approach the equator. From the facilities which these winds afford to navigation, they are called the trade-winds; and a modification of them in the Indian Ocean produces the monsoon, or alternate dry and rainy winds, which are either hot and dry, or hot and moist, which generally result from the local position and physical character of a country, the sirocco is one of the few experienced in Europe. It occurs in the islands and coasts in the Mediterranean, such as Italy, Sicily, and the Ionian Islands. The sirocco is generally felt in these places when the wind comes from S.E. or S.S.E., and its approach is known by the peculiar sensations felt throughout the animal system; there is a general lassitude or torpor of the muscular system, attended by heaviness and oppression, inducing an inaptitude to any exertion, either mental or corporeal; everything that is touched is damp and clammy, particularly the clothes, which feel as if they had been wrung out of water; the appetite is impaired, thirst increased, and perspiration from the two latter sometimes only by the second; there is a sensation of burning heat in the chest. Independent of these effects in the animal system, Mr. Montgomery Martin* gives many curious examples of other results produced by this wind. The walls of houses, stone-floor, and pavements, invariably become moist when the sirocco blows; and yet vegetables appear as if shrivelled up for want of moisture. Wine bottled during a sirocco is greatly injured and often destroyed, and meat becomes tainted very quickly. No carpenter uses glue during the sirocco, for it does not adhere; nor will a painter willingly work at this time, for the paint will not dry, or if apparently dried by a subsequent dry wind, the wet paint oozes out. Bakers diminish the quantity of their leaven at this period, as dough is found to ferment sufficiently without it. Dr. Hennen * remarks, in reference to the action of the sirocco on man, "I have scarcely ever met an individual who was not more or less sensible to these effects; history connect itself with different possessors of the same who have felt them but slightly on their first arrival, have become agreeable to them during some time; many can foretell the approach of a sirocco some time before it begins to blow, by the peculiarity of their feelings; and there are few indeed who cannot at once decide that this wind has commenced, without making any reference to external objects: but it is by the sick and the weakly convalescent that its depressing effects are most severely experienced."

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Passing over from the European continent to the more sultry regions of Africa, we find a remarkable wind, called the harmattan, blowing from the interior towards the Atlantic. The nature of this wind has been particularly described by Dr. Dobson, in the 'Philosophical Transactions;' and from his account it appears that between the equator and 15° north latitude the harmattan blows generally from about the

* 'History of the British Colonies,'
harmattan is deemed salubrious; it is a healing agent for remarkable mountains, called Table Mountain, to those suffering from intermittent fevers or the smallpox. An apartment, it is evaporated immediately; and by the ninety due South from the Pole toward the Equator, our latitude.

If water is thrown on the floor of a desert, and where the sun's rays are very powerful, the sand and where the air meets neither the earth nor the sea furnishes us with the means of measuring the surface and the extremeness of the air, plants become shrivelled up and the altitude of the Polar Star will be found to decrease and reduced to fragments. This thirst of the air for proportion. Half-way between the Pole and the Equator, for in this position it would appear in our zenith, or right above our heads, and consequently 90 deg. above the horizon. Now, suppose we travel 10 deg. in the direction of the Equator, or due South, our distance from the Pole would be diminished from 90 to 80 deg., and the Polar Star would appear to have descended in the heavens in the same proportion, that is, its latitude and its altitude would be each 10 deg.

If we travel 20 or 30 or any number of degrees under ninety due South from the Pole towards the Equator, our latitude becomes the altitude of the Polar Star. These peculiar winds which sometimes attack a ship at sea, and known as hurricanes, tornados, typhoons, &c., are more or less similar to whirlwinds, and depend on sudden changes in the condition of the atmosphere. In mountainous countries, local winds assume various peculiarities according to the physical features of the country. Thus, at the Cape of Good Hope there are four remarkable mountains, called Table Mountain, the Sugar-Loaf, James Mount, and the Devil's Head. In the summer season Table Mountain is sometimes suddenly covered with a white cloud, called by the sailors the "table-cloth," from its flat and white appearance; and when this cloud seems to roll down the steep face of the mountain, it is a sure indication of an approaching gale of wind from the S.E., which generally blows with great violence, and sometimes continues for one or two days. On the first appearance of this cloud, the ships in Table Bay begin to prepare for it, by striking yards and topmasts, and making everything as snug as possible. "When the cloud appears, the sailors are wont to say that the "Old Gentleman" is about to breakfast, dine, or sup, according to the hour when this "table-cloth" is spread.

Wild Flowers. — One characteristic of our native plants we must mention, that if we miss in them something of the gorgeousness and lustre of more tropical flowers, we are more than compensated by the delicacy and variety of their perfume; and just as our woods, vocal with the nightingale, the thrush, and the thrush, can well spare the gaudy feathers of the macaw, so we can consign the ocicums, the cactuses, and the pipomæas of the Tropics, for the delicious fragrance of our wild banks of violets, our bilow-of-the-valley, our poison tires, even for the passing whiff of a Hawthorn bush, a clover or bean field, or a gorse common. — Quarterly Review, No. 139.

Latitude popularly explained. — We have shown, that in consequence of the spherical surface of the earth, the Polar Star appears to a person travelling due North or South to ascend or descend in the heavens in proportion to the space passed over. Upon this fact a most important principle in geography is established, namely, that the latitude of any place in the Northern hemisphere always corresponds to the altitude of the Polar Star; and hence, to ascertain our distance from the Equator, in the Atlantic Ocean for instance, we have only to take the altitude of the Polar Star, and our latitude is determined. If the Polar Star, for instance, is 10, or 20, or 30 deg., our position would be of the same proportion. When from any atmospheric disturbance the air is set in motion, the phenomenon of the hot wind ensues, and particles of scorching sand and dust are wafted along with it. The most distressing and destructive of all the varieties of wind is perhaps the hot wind of the Desert. In Central Africa, in Libya, in Syria, and in Arabia, where the soil is covered with a thick stratum of loose sand, and where the sun's rays are very powerful, the wind is often absolutely insupportable. At such time it is called siroon, or the "poison-wind," by the Arabs; and khawisin by the Syrians, from a word expressive of the period during which it prevails, viz., at the equinox. In the desert, the outer skin peels off from the hands and face. And yet the hard desert sand is deemed salubrious; it is a healing agent for conditions.

In the eastern part of the desert, the sky becomes overcast, the sun loses his brilliancy; the air is not cloudy, properly speaking, but is loaded with small gritty particles, which penetrate everything. When the hot blast is passing rapidly, the heat is so increased as to take away life almost instantaneously. This death is a true convulsion, resembling that in a kind of vacuum, entering into convulsion; the circulation becomes disturbed in the vessels; the blood flies from the heart to the head or the chest; and hence ensues hemorrhage at the nose and mouth after death. This wind attacks especially men of a full habit of body, and also those whose muscles are weakened by fatigue. The only mode of checking these violent effects is to cool the mouth and nose with a kerchief; the camels bury their mouths and noses in the sand, and there keep them till the violence of the blast is abated. Another quality of this wind is its extreme dryness. If water is thrown on the floor of an apartment, it is evaporated immediately; and by the extreme dryness of the air, plants become shrivelled up and dry. The heat parches the ground, and the moisture, so to speak, increases the effect of the wind on the animal frame, by evaporating too rapidly the perspiration exuding at the pores.

The explanation which Volney gives of the cause of these hot winds is in principle doubtless correct. They are always found to occur in countries where deserts abound, and where the air, meeting neither with brooks, nor lakes, nor forests, becomes heated by the action of a nearly vertical sun, and by reflection from the sandy soil. When, from any atmospheric cause, this mass of air is set in motion, the phenomenon of the hot wind ensues, and particles of scorching sand are wafted along with it.
FROISSART AND HIS CHRONICLE.
No. VIII. (concluded).

THE ARTEVELDS.

The sufferings of the people of Ghent increasing daily, an attempt was made at negotiation, and a council agreed to be held at Tournay, at which certain distinguished persons and deputies were to meet the Earl of Flanders, and endeavour to arrange the terms of a peace between him and the revolted Ghentese. There was but little hope of success, for the earl's mind, embittered not only by the long-continued opposition to his own authority, but by the hereditary recollections of his house, was known to be in no mood to agree to reasonable, much less to humane and merciful conditions; and on the other hand it seemed almost equally certain that Philip Arteveld and other of the chief leaders would rather die than make a disgraceful submission. Their temper had been sufficiently shown in an incident of a previous attempt to negotiate. Two deputies from Ghent, thinking only of the sufferings of their countrymen, or won by even less creditable influences, agreed that the town should be surrendered; for which Van den Bosch stabbed them to death in the market-place.

"When the day desired was come that Philip Arteveld should generally report the effect of the council holden at Tournay, all the people of the town of Ghent drew them to the market-place on a Wednesday in the morning, and about nine of the bell, Philip Arteveld, Peter den Bosch, Peter de Nuitre, Frances Atreman,
and other captains came thither, and entered up into
the common-hall. Then Philip leant out of a window, and
began to speak, and said, 'Oh, all ye good people, it
is of truth, that at the desire of the right honourable
lady, my lady of Brabant, and the right noble Duke
Albert, count of Hainault, Holland, and Zealand, and,
of my lord the Bishop of Liege, there was a council
held, and accorded to be at Tournay, and there to con
personally the Earl of Flanders, and so be certified to
these said lords, who have nobly acquitted themselves:
for they sent thither right notable counsellours, and
knights and burgesses of good towns; and so they and
we of this good town of Ghent were there at the day
assigned, looking and abiding for the Earl of Flanders,
who came not nor would not come; and when they
saw that he came not, nor was not coming, then they
sent to him to Bruges, and there they found him, who
made them great cheer as they said, and heard well
their message. But he answered them and said, that
for the honour of their lords, and for the love of his
sister the lady of Brabant, he said he would send his
council to Tournay within five or six days after, so well
instituted, and that they should have plain and full
of his intention and mind. Other answer could
they none have, and so they returned again to Tournay.
And then, the day assigned by the earl, there came
from him to Tournay, the Lord of Raseflez, the Lord
of Goutris, Sir John Vilame, and the provost of Harle-
queen and Raseflez; and there they showed graciously
their lord's will, and certain arrest of this day, that
the peace where was to be held, was to be between the
earl and the town of Ghent. First, determinedly they said, the earl will that
every man in the town of Ghent, except prelates of
church and religious, all that be above the age of fif-
teen years and under the age of sixty, that they all in
their shirts, bare-headed and bare-footed, with halters
about their necks, avoid the town of Ghent, and so go a twelve
miles to the plain of Burlesquans, and there they shall meet the Earl of Flanders, accompanied with
such as it shall please him; and so when he seeth us in
that case, holding up our hands and crying for mercy,
then he shall have pity and compassion on us if it please
him. But, sirs, I cannot know by the relation of any
of his council, but that by shameful punishment of justice,
there shall suffer death the half of the town, and the
people of necessity do one. The first is, if ye will let us
enclose ourselves and secure up all our gates, and then
confess us clean to God, and let us enter into the
churches and minsters, and so let us die for famine,
repentant of our sins like martyrs, and such people as
no man will have mercy of; yet in this estate God
shall have mercy of our souls, and it shall be said in
every place where it shall be heard, that we be dead
valiantly, and like true people: or else, secondly, let
us all, men, women, and children, go with halters about
our necks in our shirts, and cry mercy to my lord the
Earl of Flanders; I think his heart will not so be in-
durate, as when he seeth us in that estate, but that his
heart will meltify, and take mercy of his people; and
as for myself, I will be the first of all to appease his
displesure; I shall present my head, and be content to
die for them of Ghent: or else, thirdly, let us choose
out in this town five or six thousand men of the most
able and best appointed, and let us go hastily and assail
the earl at Bruges, and fight with him; and if we die
in this voyage, it shall at least be honourable, and God
shall have pity of us, and all the world shall say that
valiantly and truly we have maintained and maintained
our quarrel. And in this, if God will have pity of
us, as anciently he put his puissance into the hands of
Judas Maccabæus, duke and master of his chivalry,
by whom the Assyrians were discomfited, then shall
we be reputed the most honourable people that hath
reigned since the days of the Romans. Now, sirs, take
that good heed which of these three ways ye will take, for
one of them must ye needs take.' Then such as were
next him, and had heard him best, said, 'Ah! sir, all
we have our trust in you to counsel us; and sir, look,
as ye counsel us, so shall we follow.' 'By my faith,'
quoth Philip, 'then I counsel you let us go with an
army of men against the earl; we shall find him at
Bruges, and plainly assay his forces; and if we
shall see the earl, and plain knowledge of his forces,
he will issue out to fight with us, by the pride of them
at Bruges and of such as be about him, who night and
day informeth and stirreth him to fight with us; and if
God will by his grace that we have the victory, and
discomfit our enemies, then shall we be recovered
for ever, and the most honoured people of the world;
thousand men, he soon reached the neighbourhood of
Bruges, about three miles from which place he halted.
The news of this unexpected, and, as it appeared,
equally desperate and futile march, reached Bruges
on a day of great rejoicing. Immediately rushed forth
the earl with a body of eight hundred knights and
squires, followed by an immense assemblage of the
people of Ghent, composed of armed citizens, who
heard, to their horror, a confused mass of their
townsfolk as they passed, passing, and of all things, a
plundered and burned and desolate place; then
saw that the enemy were distant; and still. Then he
begantospeak,andsaid,'Ah! yegood
valiantly, and truely we ha...
not meet for such a lord: there was neither hall, parlour, nor chamber; it was but a poor smoky house; there was nothing but a poor hall, black with smoke, and above a small plancher (or planked floor), and a ladder of seven steps to mount upon; and on the plancher there was a poor couch, whereas the poor woman's children lay. Then the earl, sore abashed, and trembling at his entering, said, 'O good woman, save me: I am thy lord, the Earl of Flanders; but now I must hire these churls to help me.'

The poor woman knew him well, for she had been oftentimes at his gate to fetch alms, and had often seen him as he went in and out a-sporting; and so incontinent as hap (it happened) was he answered; for if she had made any delay, he had been taken talking with her at the fire. Then she said, 'Sir, mount up this ladder, and lay yourself under the bed that ye find there, as my children sleep; and so in the mean time the woman sat down by the fire with another child that she had in her arms. So the earl mounted up the plancher as well as he might, and crept in between the couch and the straw, and lay as flat as he could; and even therewith some of the cutters (riders or horsemen) who entered in看到了 some of them said they had seen a man enter into the house before them; and so they found the woman sitting by the fire with her child: then they said, 'Good woman, where is the man that we saw enter before us into this house, and did shut the door after him?' 'Sir,' quoth she, 'I saw no man enter into this house this night; I went out right now, and cast out my bed and did my best; and I had here, I could not tell how to hide him. Ye see all the easement I have in this house; here ye may see my bed, and here above this plancher lieth my poor children.' Then one of them took a candle and mounted up the ladder, and put up his head above the plancher, and saw there none other thing but the poor couch where her children lay and slept; and so he looked all about, and then said to his company, 'Go we hence, we lese the more for the lesse; the poor woman saith truth, here is no creature but she and her children: and then they departed out of the house, after that there was none entered to do any hurt.' On the following night the earl succeeded in making his escape from Bruges.

The well-concerted and well-executed measure was as calamitous to Bruges as it was fortunate for the rival city. The town was given up to pillage, and its commerce in consequence destroyed for a considerable period. And besides all those who perished in the battle and in the flight, a horrible carnage took place in Bruges of the earl's people and of the trades who adhered to him. Arteveld succeeded in staining the vengeance of the Ghentese for their sufferings in the morning; but after that, various nobles, magistrates, &c. were sent to the scaffold as traitors to their country. This victory placed Flanders at the foot of Philip Arteveld, who assumed all the pomp of sovereignty. His success happened at a critical time. Through a considerable portion of Europe the spirit of impotent malice, which had cumbered up and the people becoming daily more aware of their natural rights, whilst unfortunately utterly destitute in most cases of the knowledge how best to retain them or to use them when obtained. The continental princes were alarmed, and united against the common danger under the banner of the young king of France, Charles V. In November, 1515, the sacred Oriflamme, as displayed in the midst of an immense army, commanded by the skilful and cruel Olivier de Clisson, and which was advancing towards Ghent. It stopped at Roosebeke, between Courtray and Ghent, whither,
RAILWAY RAMBLES.

MOOR PARK.

[Concluded from page 415.]

The earliest mention of the Manor of the Moor occurs in the particulars of a curious dispute at law in the fifteenth century, when the Abbot of St. Alban's complained that the tenant who held the estate from him refused either to pay his quit-rents or to perform certain covenanted services, among which was the finding for the abbot and his successors one mag-horse to carry him to Tynemouth, whenever he, or they, should visit that cell. The cause was decided in favour of the abbot. We next find the Moor in the possession of Ralph de Boteler, lord of Sudely in Gloucestershire, who paid one penny yearly as acknowledgment that he held it from the Abbot of St. Alban's. During the wars of the Roses, he was unfortunate enough to be on the wrong or unsuccessful side, and was accordingly arrested here by Edward IV., who at the same time took possession of the estate. By Edward it appears to have been granted to the brother of the great kingmaker, George Neville, archbishop of York, who built or rebuilt the mansion. In this the king was frequently entertained; till one day, when he was staying here with the Duke of Clarence and Warwick, as he was washing his hands before supper an attendant whispered in his ear that armed men were lurking near the house. The period was just after the hollow reconciliation concluded between the all-powerful Warwick and the not very powerful king, in 1469. Edward had little appetite for supper after this; watching his opportunity, he got secretly to horse, and flew with the greatest possible speed to Windsor Castle. Soon after the archbishop was confined at the "Moor," in a kind of honourable restraint, in consequence no doubt of the king's growing jealousy of his brother. When subsequently Warwick took the bold step anticipated, and changed sides, and fell, the archbishop was committed to the Tower; and although he was subsequently restored to the king's favour, it was but for a short period. The archbishop, says Godwin, the ecclesiastical historian, "was hunting with the king at Windsor, when he made relation to him of some extraordinary kind of game wherewith he was wont to solace himself, at a house which he had built and furnished sumptuously, called the Moor, in Hertfordshire. The king seeming desirous to be a partaker of this sport, appointed a day when he would come thither and hunt, and make merry with him. Hereupon the archbishop, taking his leave, got him home, and thinking to entertain the king in the best manner it was possible for him, he sent for much plate that he had hid during the wars, and also borrowed much of his friends. The deer which the king hunted being thus brought into the toils, the day before his appointed time he sent for the archbishop, commanding him, all excuses set apart, to repair presently to him at Windsor. As soon as he came, he was arrested of treason; all his money, plate, and moveables, to the value of twenty thousand pounds, seized upon for the king, and himself a long space after was kept prisoner at Calais and Guines, during which time the king took upon himself all the profits and temporalities of the bishopric. Many other things were then taken from him; he had a mitre of inestimable value, by reason of many rich stones wherewith it was adorned, that the king broke, and made thereof a crown for himself." This last blow appears to have broken the archbishop's heart; he died in 1476, "as was thought of grief and anguish of mind."

After the death of the Archbishop of York, the manor remained in the possession of the crown, till it was given by Henry VII. to John, earl of Oxford, the nobleman who did him such excellent service at Bosworth, where he led the van of the army. Like many other of our ancient manors, its history still continues to form a running commentary upon the unsettled state of the relations existing between the aristocracy and the supreme head of the government down to a very recent period. It was not long before it reverted to the crown; then was granted to Cardinal Wolsey, again to be taken possession of, till finally it was settled on the Earl of Bedford by James I. The next possessor was William, earl of Pembroke, who divided what was called the Moor Park estate from the manor, and sold
it to Robert Carey, earl of Monmouth, a third son of Lord Husson. It is this estate which is now known as Moor Park, and on which stands the mansion we have described. Among its different possessors since this division have been Thomas, earl of Ossory, who married a descendant of Maurice, Prince of Orange; the Duke of Monmouth, son of Charles II., beheaded by his uncle James; B. H. Styles, Esq., who, as we have seen, expended such immense sums here; and Lord Anson, the great navigator, whose history forms the most interesting of the memories connected with Moor Park.

The property was the son of a gentleman of good family in Staffordshire, who, early experiencing the delight he took in everything that related to the sea, with its thousand romantic and picturesque features, gave him such an education as would best fit him for a naval life. When he entered the service he speedily attracted attention by his enthusiasm and ability, and rose from station to station, and had important commissions intrusted to him. At the breaking out of the Spanish war a wider field was opened for his exertions, and he did not fail to improve the occasion to the utmost. He was appointed, in 1740, to the command of a small squadron, with orders to harass the coasts of Chili and Peru, and to co-operate when necessary with Admiral Vernon across the Isthmus of Darien. Late in the year, and with ships utterly in a deplorable condition; But if we go back beyond these two, to a third, the most important project was in Anson's mind. He now undertook a scheme of improvement on the grounds, which cost him the whole not less than 80,000l. Our readers, remembering what we have before stated as to Mr. Styles's expenditure of 150,000l., may naturally wonder how the Centurion, and the outpouring of his life, could and would do something. For eight months he kept the Spanish coasts in continual alarm, during which he captured several small vessels, and burned some of them; and even when that great number under his command amounted to just three hundred and thirty-five. But the conquest over difficulties is one of the great lessons that genius seems destined to teach us: Anson, crippled as he was, and unable to do what had been originally planned for him, could and would do something.

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upon arches of stone, and ending with two other sum-
mer-houses even with the cloisters, which are paved
with stone and designed for walks of shade, there being
none other in the whole parterre. Over these two
clumps of forest-trees beyond, and then, through an
opening near the centre, a fine perspective of undu-
lating and richly wooded scenery. Besides the vases,
the only ornaments of the terrace are two large stone
seats, one at each end, from the designs of the late Lady
Farnborough. All is simple, massive, grand, and,
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The cloister facing the south is covered
with vines, and would have been proper for an orange-
house, and the other for myrtles or other more common
greens and had. I doubt not, been used for that purpose,
if this piece of gardening had been then in as much
vogue as it is now. From the middle of this parterre
is a descent by many steps, flying on each side of a
grotto that lies between them, covered with lead and
flat, into the lower garden, which is all fruit-trees
ranged about the several quarters of a wilderness
which is very shady; the walks here are green, the
grotto embellished with figures of shell rock-work,
fountains, and water-works. If the hill had not ended
with the lower garden, and the wall were not bounded
by the common way that goes through the park, they
might have added a third quarter of all greens; but
this want is supplied by a garden on the other side the
house, which is made by Mr. Styles at an expense of
5000L. Pope, adorned with rough rock-work and
figures, is one of his greatest achievements. I was
acquainted with it, and thought the open space we
look down upon it, and from the opposite side.

Themanagement of its present proprietor, the Marquis
of Westminster, is admirably directed; and lastly laid out an admir-
able kitchen and fruit garden, where he planted the
apricot since so celebrated as 'The Moorpark.'

Going through the mansion, and issuing from it on
the opposite side to that where we entered, we have a
striking illustration of the revolutions of taste; to our
surprise the ground before the northern front seems to
have been put on the same level, and the former aspect
is a magnificent terrace extending the whole length of
the house, and we descend the steps to greensward in
geometrical patterns, gravel walks, statues, fountains,
and parterres. But as we turn to the left we see no
long laurelled walk: that has not been revived; neither
do we see any signs of stone-paved cloisters with leaden
roofs. The truth seems to be, that in every system of
gardening, and indeed in all other matters that obtain
the general approbation of a period, there is something
good; and most probably a good that is especially
wanted to modify or correct some former evil: but in-
stead of patiently analyzing both, so as to combine their
advantages and reject their disadvantages, the old is
turned up root and branch, and the new looked upon
precisely what was wanted: till time discovers its defi-
ciences also; when either the same process is repeated
with respect to some fresh novelty, or there is a judi-
cious recurrence to past experience for a less sweeping
remedy; the last has been the case at Moor Park under
the management of its present proprietor, the Marquis
of Westminster. None of the stone and mortar and
lead absurdities of the old system, or the long double
straight ranks of evergreens, are now permitted; but
there is a terrace which it does one good to walk over,
so magnificent is the effect of the broad and long
esplanade, with its picturesque and imposing foliage
on the right, towards the house, and its low wall (on the

other side of which the ground falls to a considerable
depth), cutting across as it were the bottom of the beauti-
ful picture which opens on the left, where the deer are
sporting in the valley of the foreground, noble

From the middle of this parterre(artificially made, but not

theless real in appearance) suggests at once the idea that there could be no walk
here but for the terrace. At the farther end, the
ground descends on the right as well as on the left;
where accordingly we find a flight of steps by which
we again pass into the pleasure-grounds, here disposed
ranged about the several quarters of a wilderness
which is very shady; the walks here are green, the
grotto embellished with figures of shell rock-work,
fountains, and water-works. If the hill had not ended
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The managemen-
in conclusion, that the trees of these grounds would form the finest study possible for the artist; so varied are they, and so truly perfect each in its individual characteristics. The following we must mention. Standing on the spot just referred to, the eye is drawn away, even from the view described, by the appearance of a clump, as it seems, of spruce firs, so regularly pyramidal in shape, from the lower branches, the entire conicalities of which actually lift the eye to an immense distance, to the taper top, which ascends to a vast height, that no one can witness them without wonder and admiration. Going nearer, we find to our astonishment that this clump, as it seemed, is but one tree. As we walk round it, a distance of nearly two hundred and fifty feet, we can hardly believe that there is some deception—some trick of Nature to entice here and thence with honey. The part there is a clover opening among the branches, by which we may enter the gigantic screen; when we perceive it is truly but one tree, one parent trunk, although many other trunks, having issued from that, spread along the ground for some space, and then rise like so many columns upwards, the whole presenting the appearance we have described.

ON THE SOURCES AND USES OF WAX.

Most varieties of wax, properly so called, are the produce of the bee modified more or less by artificial processes. Until within the last few years, it was not known whether, in the state as this secretion is in the hive, the substance which the bees collect is the honey of flowers, the pollen or farina, and syrupy food supplied by the bee-keeper; and it used to be supposed that as the saccharine ingredients conduct to the formation of hive-honey, so does the wax result from the pollen of flowers. The bees collect the pollen on their thighs, carry it to the hive, and there—according to the old theory—white or yellow wax. The latter there is as ever, such facts accumulated, as show that this cannot be the case. First, where no more comb or waxen structure is to be built in the hive, as in old hives, the bees carry in the greatest quantity of pollen. Second, the pollen differs materially from wax: the latter, when examined between the fingers, being adhesive; the former, when treated in the same manner, is flaky and lacy on the application of heat, whilst the former burns to ashes. Third, the wax of new combs, from whatever source collected, is uniformly white; whereas the pollen, as gathered by the bees, varies in colour, agreeing with that of the anther-dust of the flowers in blossom at the time of its collection. Moreover the pollen retains its colour when treated in the Atlantic wax; whereas the wax gradually changes its colour in the hive. Lastly, fresh colonies of bees carry in very little if any pollen for some days after swarming, though combs are formed within that period. John Hunter, Huber, Dr. Bevan, and others, have found, that if the bees can have access to honey, sugar, or syrup, wax becomes accumulated in the hive, whether or not any pollen is collected; and it has also been proved, that the object of the pollen is, after preparation by the 'nursing-bees,' to form food for the young. Of all the pollen collected, one part is immediately prepared as 'infant's food' by the nurses, and the other part is stored for future use.

The wax, then, is understood to result from the saccharine matters taken into the stomach of the bee: and these also form the food of the adult bee, some kind of separation must take place. This separation has been investigated by many naturalists, and the following facts have been ascertained:—The nursing-bees appear to take no more honey or syrup than is sufficient for their own support; their office being to prepare the pollen as food for the young. But the wax-workers take into the stomach a much larger portion of saccharine matter than is necessary for their subsistence; they are capable of an increase of size, since a store of honey can be retained within their bodies. Here the change occurs which converts honey into wax; a change, the nature of which will probably always rank among the mysteries of organic chemistry. On the ground that was paved, the earth itself, so tosorma very plastic mass.

The wax thus formed in the bodies of the bees is intended by them as a building-material, though applied by man to very different purposes. In what way the wax leaves the body of the insect, whether by the mouth or not, was formerly a subject of great controversy. It was known seventy years ago that wax is secreted in thin scales among and between the abdominal rings of the insect; and more recent discoveries have shown that there is a secreting membrane on the body of the insect, capable of giving out the wax, from within, in the form of a transparent fluid, which immediately cools and solidifies in the form of thin scales or lamina. When wax is wanted for the construction of the comb, it appears to be be a fact that wax, and the supersaturated—i.e. if we made use of the fluid wax, from any one day. The bees fill their crops with honey, and, retaining it in them, hang together in a cluster from the top of the hive. Here they remain, apparently in a state of profound inactivity, for about twenty-four hours, during which period the change, whatever it may be, is progressing by which honey is converted into wax. The wax, thus prepared, was then used as a building-material, though it has been boiled till thoroughly melted, with

...
sufficient water to prevent burning; the melted mass being afterwards pressed through a canvas bag into a pan of cold water, from which the wax is afterwards separated, re-melted to purify it still further, and poured into moulds. A difficulty is usually experienced from the circumstance that the wax and heterogeneous impurities float together on the surface of the water, an inconvenience which Dr. Bevan obviates in the following manner, as described in his treatise on the 'Honey-Bee':—"The kettle I use is in shape like a flower-pot; the strainer is of the same shape, but only half the depth, and it drops into the larger kettle full half-way, with an accurate fit. The bottom of this inner kettle is perforated all over with very fine holes, and has a couple of ring handles. The rough combs being placed in the large kettle, water is poured in, till it rises nearly half-way up the inner kettle, and the whole is placed over a moderate fire. As the wax melts out of the crude mass, it percolates through the strainer and floats upon the surface, tolerably free from impurity; from whence, when cool, it is taken off in a cake, for being re-melted and further depurated, which may be effected by the same apparatus, varying the use of it a little. The cake of wax just referred to is now put into the upper kettle, and water, to the depth of a few inches, into the lower; the wax is then slowly melted again, when it will drop through the strainer and swim on the surface of the water, the impurities falling to the bottom. It is then withdrawn from the water, and any still remaining impurities scraped off, the wax should be again re-melted, with just water enough to avoid burning, and poured into the moulds; the latter having been previously rinsed with cold water, to prevent the wax from adhering to them: the moulds should then be placed near the fire, and covered over, to be allowed to cool gradually, or the cakes will be liable to crack.

The circular cakes, formed by the above or any similar process, constitute the bees'-wax of commerce,—a brightish yellow, insipid, and somewhat unctuous substance. As brought to market, it is frequently adulterated with earth, pea-meal, resin, and other substances. The presence of the former may be suspected when the cake is broken, or very brittle; or when its colour inclines more to grey than to yellow; and the presence of resin may be suspected when the fracture appears smooth and shining, instead of being granulated. It would scarcely be supposed, perhaps, that although such large supplies of this substance are furnished by English bee-keepers, there are no less than seven thousand cwt.s. imported per annum from foreign countries, of which three-fourths come from northern and western Africa.

The application of bees'-wax is very varied. Calico-printers used formerly to stop out certain colours by means of wax, and those in the East Indies still do so; that is, place a layer of wax at such parts as are intended to resist certain colours. Gardner's process, use of composition of wax, pitch, and oil of almonds, as a material for grafting, instead of clay. In resins, varnishes, and cements of various kinds, wax is used in an infinity of ways, combined with other substances, according to the nature of the object in view. It is also used medicinally, either dissolved into an emulsion, or mixed into the form of an electuary with spirits, or oil of almonds, or conserve of roses.

There are many purposes, however, for which bees'-wax cannot be used till it has undergone the process of bleaching, by which it becomes white wax. Many experiments have been made to devise the best mode of bleaching the wax, but the following will explain the general nature of the process:—The yellow wax is first cut into small fragments, and melted in a copper vessel with sufficient water to keep it from burning. The vessel is so disposed that the wax may flow gradually through a pipe into a large tub filled with water, and covered with a thick cloth, to preserve the heat till the water and impurities are settled. From this tub the clear melted wax flows into a vessel, the bottom of which is full of small holes, and hence it falls upon a cylinder constantly revolving over water, where-by the wax is cooled, and at the same time drawn out into thin shreds or ribands. The continual rotation of the cylinder carries off these ribands as fast as they are formed, and distributes them through the tub. The wax, thus granulated or flattened, is exposed to the air in linen cloths, stretched on large frames, about a foot or two above the ground, in which situation it remains night and day for several days, exposed to the air and sun, until the yellow colour nearly disappears. In this half-bleached state it is heated up in a solid mass, and allowed to remain for a month or six weeks, after which, to complete the bleaching, it is re-melted, ribanded, and exposed as before, till it wholly loses its colour and odour. Numerous plans have been proposed for bleaching by a more expeditious process.

White wax (by whatever process bleached) is the substance of which wax-candles are made. The wax is melted, and poured, by means of a ladle, on the wick, which hangs suspended over the vessel containing the wax; coating after coating is laid on, till the form of which it is to be employed assumes the proper thickness; and the candle is then rolled between polished boards to give it a smooth and equable surface.

Whoever has witnessed a 'wax-work' exhibition, there sees one of the many modes in which wax is applied. The celerity with which it melts, and solidifies again in cooling, renders it a convenient substance for taking impressions, from appropriate moulds, of busts, statues, anatomical preparations, medals, ornamental devices, and other objects. Fruit and flowers are imitated in wax, by some such process as the following:—Half of the fruit or other object being buried in clay, the edges and the extant half are well oiled. Liquid plaster of Paris is poured on, to form one half of the mould; and when this is concreted, the second half is laid on in a similar manner. When the wax is removed, and the two parts of the mould being joined, a little wax, coloured, melted, and brought to a due heat, is poured through a hole made in any convenient part of the mould, and shaken so as to line the interior. The mould being lastly broken, the waxen interior comes out a copy of the fruit.

Wax has been applied to a remarkable species of painting, called encaustic, where the canvas or paper is coated with a layer of wax, on which the colours, prepared in a peculiar way, are laid; and by exposing the wax to a certain temperature, it softens sufficiently to combine with the colours and thus fix them. There is also, for pictorial purposes, a mode of gilding on wax, not however very frequently adopted, but is, as a principle, to remand that wax is secreted by many plants. It is found very abundantly, combined with resin, covering the trunk of the South American wax-palm to the thickness of two inches, one-third being wax and two-thirds resin. It is found encrusting the seeds of the wax-tree of Louisiana. The Myrica cerifera, by which this last-named tree is botanically known, yields the wax in great abundance by boiling the seeds in water: seven pounds of wax being often obtained from the seeds of one shrub. The myrtle, the alder, the poplar, and the pine, all yield wax under certain circumstances; and the 'bloom' of fruit is found also to consist of wax. All these varieties of vegetable wax possess many properties in common with bees'-wax, but there are many chemical differences between them.
A DAY AT A VINEGAR AND BRITISH-WINE FACTORY.

There exists between the apparently dissimilar liquids wine, spirit, beer, and vinegar, a connexion little supposed by the majority of those who use them. Who would expect, unless he had attended somewhat closely to the matter, that the same corn which yields our quarter loaves may be made to yield spirit, and beer, and vinegar, by particular processes? Or that wine, cider, beer, malt, sugar, and molasses, are all capable of yielding—and many of them are actually made to yield, in manufacture—that very distinct and peculiar liquid, vinegar? These are remarkable instances of vegetable chemistry, or of the changes which heat and other agents produce in vegetable substances. The full explanation of all these changes forms one of the most difficult branches of science; but the manufacturing arrangements are capable of being described in a general manner, without involving the delicate and complicated reasonings of the chemical philosopher. Having, in connexion with two of our former "visits," been enabled to describe the brewing and distilling processes and arrangements whereby beer and spirits are produced, we may now appropriately notice in a similar manner the Vinegar manufacture. It happens, too, that the firm who have liberally afforded the facilities for this purpose, viz., Messrs. Beaufoy of South Lambeth, are not only malt-vinegar makers, but also manufacturers of "Sweets," or as they are more generally termed "British Wines." Thus the same visit will enable us to gather a little information respecting the production of wine.

The vinegar-manufactories are but few in number. There are reasons, applying to these establishments as well as to porter-breweries and distilleries, why competition cannot be carried to so great an extent as in smaller undertakings. The "plant," or assemblage of apparatus, is very costly, and the skill required in the manufacture considerable. In a Report presented by the Commissioners of Excise Inquiry a few years ago, it was stated that the number of vinegar-makers in the United Kingdom is forty-eight.

Of the five principal vinegar-works in the metropolis, four are situated on the Surrey side of the water. Messrs. Beaufoy's establishment formerly stood near where the southern approach to Waterloo Bridge occurs, and was removed thence to Vauxhall in consequence of the building of the bridge. The present works are located in South Lambeth, between Vauxhall and the Clapham Road, and occupy a considerable area of ground. In this as in most other large works, the entrance gates open into a court-yard or area, portions of which are occupied by buildings wherein the manufacturing processes are carried on. Glancing along the left boundary of the court, we see, in the first place, an excise-office, fitted up for the convenience of the officers always more or less in attendance at a vinegar-factory (as in distilleries, soap-works, glass-works, &c.), by whom the amount of duty accruing on the manufactured product is ascertained. Beyond this is the "shipping department," or counting-house for the management of all matters connected with the coasting trade and the reception of materials; and in front is a weighing-machine. Adjacent to this is the "chemical-room," for the prosecution of experiments, and the analysis of liquids, arising out of or connected with the

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operations of the establishment. Ranges of stabling occupy a further portion of this line of buildings; and the remainder consist of fermenting-rooms connected with the manufacture.

On the right of the court-yard are counting-houses and offices; beyond which the width of the court grows and increases. Immediately in front is the main building wherein the manufacture is carried on, and the successive stories of which exhibit a varied assemblage of apparatus. Beginning at the top floor, we find this appropriated as store-rooms, for the malt used in the vinegar manufacture, and the sugar and fruit for the wine manufacture. In various rooms and compartments there are under-backs and jack-backs, while the west side of the building contains machines for grinding and crushing malt, fruit, and sugar, and all the arrangements antecedent to what we may term the chemical portions of the several processes.

At a lower level we find, from the numerous pipes extending in all directions, that liquids are here brought to act upon the dry ingredients. Here, too, are large copper boilers for hot water; mash-tuns, similar to those used by brewers; and conduits for liquids both into and out of these vessels. On the ground-floor the apparatus marks a more advanced stage of the manufacture; here are "under-backs" and "jack-backs," a refrigerator, or cooling-machine, a range of fermenting tuns, another range of wine-presses, and other vessels and machines pertaining to the two branches of manufacture.

The ground this building, which is known as the "Brew-house," is another called the "stoves," or the "store-room," kept carefully closed on all sides, and brought to a considerable heat within, for the furtherance of a very delicate part of the process of vinegar-making. Here are the buildings connected with one or two other branches of manufacture carried on by the same firm, which we shall not here notice further than to say that Messrs. Beaufoy are also "millers" and "drug-grinders." A detached building in a more remote part of the yard serves as a store-house, the internal arrangements of which exhibit a specimen of very careful and minute classification. It is a feature in the establishment to make and repair on the premises as many of the implements and apparatus employed as possible; a general censuring of anything of this nature is always in requisition; and these are under the especial control of a store-keeper. The whole of the buildings of the factory are classified into certain departments, each of which is placed under distinct supervision; and the heads of the departments are charged with the quantity of stores and materials supplied by the store-keeper. The weight and number of all stores supplied being entered in a book, as well as the department to which they are supplied, the principals can thus at any time ascertain the amount of consumption in any one department. Lead and colours, brushes and pots, for plumbers and painters; nails and screws, &c. for carpenters; hoop iron for cooperers; various tools and implements for smiths—indeed materials and tools for half a dozen different trades—are kept segregated. We have on more than one occasion had to notice a similar arrangement in large factories, where a well-planned system of economy leads to the employment, within the establishment, of a number of artisans not directly concerned with the manufacture carried on. We may in particular refer to the hat-factory described in 1838, where a smithy, a carpenter's shop, a turner's shop, all of large dimensions, formed part of the premises—not for making a hat, but for furnishing some of the appliances whereby a hat is made. All this is regulated by a well-known principle in the division of labour, which can only be developed where a large number of persons is employed.

Behind the store-house, and extending to a consider-
Dismissing any discussion of the question why one manufacturer selects one ingredient and one another, we proceed to the details of the malt-vinegar manufacture, as exemplifying most of the principles involved. Malt, it perhaps need hardly be observed, is barley brought to a particular state by heat and moisture. The process of malting converts some of the starch contained in the barley into sugar, and facilitates the similar conversion of a further portion. This conversion into sugar, called the 'saccharine fermentation,' is one of the important steps in the preparation of beer, of ale, of whiskey, and of malt-vinegar: in all of these it is requisite that the starch of the grain be converted into a kind of sugar; for it is from this sugar that the vinous fermentation produces alcohol, the parent of vinegar. Hence the early processes in an ale-brewery, a malt-distillery, and a malt-vinegar factory, are very similar.

The malt is brought to the vinegar-works which we are describing, and hauled up out of the waggon into the upper floors of the brewhouse. Here openings placed in different directions allow the malt to be poured down into large bins, from whence it is removed when a brewing is about to take place. (Vinegar-makers and distillers, as well as ale and beer brewers, give the name of 'brewing' to the extraction of a saccharine liquor from malt.) The quantity required for one brewing being measured out, and taken from the bins in sacks, it is poured through 'hoppers,' or funnels at the top of the grinding apparatus, whereby the malt is reduced to meal. The apparatus consists of both the kinds used for such purposes, viz. mill-stones and crushing-rollers, either or both of which can be employed as may be deemed best. In the one case a flat circular stone rotates and crushes beneath it the malt which flows between it and a lower fixed stone. In the other case the malt, after flowing through a shoot or trunk from the hopper, falls on a wire grating, where it becomes separated from any impurities with which it may be mixed. It then passes between two cast-iron rollers rotating nearly in contact, and becomes thus crushed to fragments. An ingenious contrivance, invented by Captain Huddart, is adopted for yielding to any hard substance which may get between the rollers with the malt; it is called a 'grinder.' It acts on the principle of stopping the revolution of the roller altogether until the cause of obstruction is removed.

When the malt is crushed or ground, it falls through a hose or trunk into the mash-tuns in the floor beneath. These mash-tuns are similar in principle to those used at the great breweries and distilleries, but smaller in size. They are circular vessels with a central 'stirrer,' or instrument for keeping in constant agitation the ingredients which may be in the tuns; the stirrer being worked by a steam-engine. It is in these vessels that the 'saccharine fermentation' goes on, or the extraction, by the action of hot water, of a sweet or mawkish substance from the malt. It is this sweet principle which subsequently yields to the brewer or distiller his spirit, and to the vinegar-maker his vinegar; and it may well be supposed that every precaution is taken, and every investigation made as to the extraction of the greatest quantity and the most fitting quality of this important agent. The quantity of water required with a given quantity of malt, and the temperature at which the water is used, vary in each particular branch of manufacture, according to the size of the 'wort' required. The arrangements at Messrs. Beaufoy's for adjusting these elements are very exact and ingenious. The hot water is let down upon the malt in the mash-tun when at the proper temperature; and in order to adjust this, the foreman of the brewery ascertains, by the aid of a thermometer, the temperature of the water, through a temporary opening in the upper part of the boiler. The arrangements at this spot are shown in the annexed cut, where is also represented a balance-weight and graduated scale, which, aided by a float on the surface of the liquid in the copper, indicates the number of inches depth of water therein.

When the water has acted on the malt for a certain period, and been constantly stirred with it, the liquor receives the name of 'wort,' and is allowed to flow through pipes out of the mash-tuns into a large cast-iron vessel called an 'underback,' measuring probably twenty-four feet in length, by eight in width. This is merely a general receptacle for the wort, into which the latter is collected when the mashing is completed. Then ensues the process of cooling, one which exhibits many remarkable differences as effected in different establishments. In our descriptions of a great brewery and of a distillery, we had to speak of large, open, shallow, airy rooms, called 'coolers,' or 'cooling-floors,' whereon the wort was poured in a thin layer to be cooled by the access of air on all sides. Such was formerly the mode adopted at the vinegar-works now under description; a surface of nearly twenty-three hundred square feet having been appropriated to this purpose. This mode has however been superseded by another, in which one hundred square feet of surface is made to yield the effects formerly wrought by more than twenty times that extent. There is a vessel now employed for this purpose, called a 'refrigerator,' which acts on the following principle:—the hot wort is allowed to flow out of the underback into an oblong vessel, and out of this latter into another receptacle in the same part of the building. A continuous pipe, between three and four hundred feet in length, passes backwards and forwards through the oblong vessel, and through this pipe cold water is continually flowing from an Artesian well two hundred feet deep. There is a constant current of wort from east to west through the vessel, and a constant current of water flowing from west to east through the pipe; and it is not difficult to see that this must have a tendency to cool the wort. There are four adjustments by which the wort may be made to leave the refrigerator at any desired tempe-
where the water leaves the pipe after having performed its office; by the side of the refrigerator is seen the 'underback.' Not only does this method require much less room than that of the 'cooling-floors,' but the time employed in cooling a given quantity of wort is reduced to one-third, and the manufacturer is rendered independent of fluctuations of the weather; for, unlike atmospheric agency, his cooling agent is brought from a source two hundred feet below the level of the ground, and is nearly equable in temperature at all times. It may be as well to remark that this method of cooling is the reverse of that adopted in the worm-tub of a distillery: in this latter case the hot liquid, or rather vapour, passes through the pipe contained in the vessel, and the cold water flows through the vessel itself; but in the vinegar-refrigerator the cold water passes through the pipe, and the hot liquid through the open vessel. The distiller's worm is not, in fact, a refrigerateur, it is a condenseur; and the condensed vapour must not be open to the atmosphere.

The reader will bear in mind that the wort thus produced is in principle precisely the same as that made by the ale and beer brewer and the distiller, differing only in saccharine strength. It undergoes, too, the same process of fermentation, subject to those limitations which may be required by the nature of the manufacture. From the refrigerator which we have just described, the cooled wort flows into a large circular receipciee sunk in the ground, called the 'jack-back,' from which it is pumped up into vessels, called 'fermenting-tuns.' Here we may remark, that a valuable system of combination or centralization is observed in the arrangement of the conducting pipes in this establishment. There are here and there large vessels which serve as a kind of centre, from each of which openings lead to several other vessels, each opening being governed by a particular valve or cock. For instance, the liquid which in various processes is contained in the 'jack-back,' has sometimes to be transferred to the fermenting-tuns, sometimes to a large back or cistern at the top of the building, and sometimes to the copper; yet there are not three openings from the jack-back for these different purposes, but one, which leads to a three-barrelled pump, whose barrels are marked respectively, 'tuns,' 'back,' 'copper;' so that by turning one of three handles, the liquid can be conveyed to one of these vessels. Again, the back just alluded to is placed in connexion with several large vessels in different parts of the premises, to any one of which its contents can be transferred by simply turning a handle. There is one of the buildings in which a hexagonal table is seen, under the bed or surface of which are six valves or cocks, all opened and shut by one key. Each one is inscribed with the name of some one vessel or building, with which it is placed in connexion by an extensive series of under-ground pipes; and the superintendent of this small piece of apparatus is in fact able to regulate the flow of the liquid under manufacture in almost every direction. The advantages derived from this method are such as generally result from a union of centralization with classification.

To describe what goes on in the fermenting-tuns is no easy matter, as it involves the little-understood process of the vinous fermentation. The brewer, the distiller, and the vinegar-maker alike expose the wort to the action of yeast and an elevated temperature; but they require very different degrees of the alcoholic development. The brewer, when his wort has fermented, gives the name of beer or ale to the product, according to the manipulation of manufacture; the distiller calls his fermented wort by the name of wash; while the vinegar-maker applies the name of gyke to the fermented wort which he uses. It is very proper that distinct names should be thus used (although those actually employed may seem somewhat unmeaning), for the liquids are by no means the same, although all produced by vinous fermentation from sweet wort.

The fermented wort, or, as we shall now term it, the gyke, is transferred from the fermenting-tuns to other vessels, where it leaves the form of fermentation, and enters to the action of yeast and an elevated temperature; but they require very different degrees of the alcoholic development. The brewer, when his wort has fermented, gives the name of beer or ale to the product, according to the manipulation of manufacture; the distiller calls his fermented wort by the name of wash; while the vinegar-maker applies the name of gyke to the fermented wort which he uses. It is very proper that distinct names should be thus used (although those actually employed may seem somewhat unmeaning), for the liquids are by no means the same, although all produced by vinous fermentation from sweet wort.

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'stoving,' or 'fielding,' according to the method followed. In the first-mentioned case, the casks containing the gyle are arranged conveniently in three stove-rooms, which are closed and locked, and then exposed to a certain temperature till the acetification has been wrought. Two minutes' stay in one of these rooms is quite sufficient to convince a visitor that vinegar is in the act of formation, the suffocating acetic vapour being insupportable. The method of stoving is, we believe, generally adopted by the vinegar-makers of France, and appears to render the manufacturer more independent of the seasons than the field process.

The process of 'fielding' is much more visible, if we may use such a term, than that of 'stoving,' from the circumstances under which it is conducted. The casks, each of which contains rather more than a hundred gallons, are arranged in long parallel tiers, with their bung-holes open and uppermost. Beneath the path which separates every two rows of casks is a pipe, communicating with the 'back' at the top of the brewhouse; and in the centre of each path is a valve or cock opening into this concealed pipe. When the casks are about to be filled, a flexible hose is screwed on to this valvular opening, and the other end of the hose is inserted in the bung-hole of the cask. Then, as the reservoir of gyle is many feet above the level of the casks, the liquid flows by its own pressure through the underlying pipe and the hose into the cask. A man guides the hose in the manner represented in the preceding cut, and has sufficient length of hose to fill all the casks in one row, one after another.

Here the vinegar remains for several weeks, or even months, the bung-holes of the casks being covered with small pieces of tile or slate, which are removed when the weather is fine. The casks are examined twice every day; and if it happens that a shower of rain comes on suddenly while the bung-holes are exposed, nearly all the hands in the vinegar department are 'turned out,' to cover the casks as speedily as possible. The air effects the same object as the heat of the stove-rooms, but much more slowly. In both cases the gyle, or fermented wort, undergoes the process of acetification, whereby it becomes converted into vinegar. In those factories where the vinegar is produced from other substances than malt, the gyle is converted into vinegar nearly in the same way as in the present case, although the gyle itself is differently produced.

When the 'fielding' is completed and the vinegar is to be removed from the casks, the arrangements are managed in a very ingenious manner. A long trough or shoot is laid by the side of one of the rows of casks, into which the vinegar is transferred by means of a syphon, the shorter leg of which is inserted in the bung-hole of the cask. The trough inclines a little from one end to the other, the lower end resting on a kind of travelling tank or cistern; so that the vinegar from several casks is collected in one tank. From the tank a hose descends to the valve placed in the ground, and the vinegar is drawn, by steam-power in the adjacent buildings, from the tank into the hose, thence into the valve, and then along an underground pipe, which terminates in one of the factory buildings. Thus the invisible moving-power is made to draw off all the vinegar from all the casks in succession. The travelling cistern, the syphon, the tank, the hose, &c., are transferred from row to row of the casks as fast as they are emptied. A portion of this operation is here represented.

The vinegar, so far as acetification is concerned, is now finished; but there is a certain purifying or cleansing required before it assumes a marketable state. This purifying is, however, not always done immediately; but the vinegar is pumped from the casks into a 'back of communication,' a centre from whence pipes conduct the liquid to a number of store-vats placed in the 'vat-warehouse.' When the vinegar is to be clarified or 'brightened for sale, it is pumped from the store-vats into vessels which are in some respects the most remarkable employed in the vinegar manufacture, or rather the clarifying ingredient is a remarkable one. In a building called the 'rape-shed' are some enormous wooden vessels called 'rapes,' each of which is filled with a filtering ingredient also called 'rape.' This double em-
ployment of the same word seems rather absurd; but it is probable that the 'rape-vessels,' or the vessels containing 'rape,' became called 'rapes' for the sake of brevity; and for the origin of the name itself we may perhaps refer to the French word 'raffe,' connected with the process of 'raffinie,' or refining. Leaving etymology out of the question, however, we may state that this rape consists of raisins, stalks and skins, which seem to filter the vinegar better than any other substance hitherto employed. It would seem pretty evident that it is not a mere filtration which the vinegar undergoes, but that in percolating over and over again through the rape, it imbibles some quality which it did not possess before. Sometimes wood-shavings, sometimes straw, and sometimes tanners' spent bark, is employed as the filtering ingredient; but the refuse of raisins which have been employed in making wine is preferred to every other material. It is a matter of immense difficulty to collect the necessary quantity of this material to fill the bulky vessels; and when once collected, we believe there is no part of the vinegar-maker's apparatus on which he places so great a value as this rape. We shall have to remark to make on this subject in a future page.

Each 'rape,' or filtering-vessel, is fitted with a false bottom, on which the filtering medium is placed. Beneath this false bottom, and above the true bottom, is inserted a cock, which allows the vinegar to flow into a back or cistern. From this a pump elevates the liquid to the top of the vessel, and hence ensues a curi-ous circuit. The vessel is filled up with vinegar, which filtrates through the raisin-refuse into the space beneath, thence into the tank, thence the pump to the top of the vessel, to recommence its circuit. Over and over again does this circuit proceed, the pump being kept constantly at work, and the vine-
gar incessantly in motion. If such a comparison might be permitted, we would liken the pump to a heart, which propels the liquid to the enormous lung—the rape—where it is purified, and then again returned to the heart. The filtering substance gradually, but very slowly, wastes away, and is renewed from time to time.

The vinegar by this process becomes transparent, or 'bright' as it is technically termed, and is then pumped from the rapes into store-vats, where it is kept till required to be put into casks for sale, and the rapes are immediately filled up with an equivalent portion of fresh vinegar, so as never to leave the raisin-
refuse idle. The vinegar-casks hold one hundred and sixteen, fifty, and twenty-five gallons respectively. Each cask is examined and gauged before being brought into the 'sending-out warehouse,' to see that it is sound and of proper dimensions. The warehouse is a large room lined on all sides by store-vats, from which the casks are filled; and on the days when these casks are to be sent off, the warehouse presents a very busy appearance, with cooperers, porters, &c. ranging the casks, marking them, and consigning them to the waggons.

Wide a few miscellaneous remarks on vinegar we must pass on to the other object of our visit. Vine-
gar is known by certain numbers, such as No. 18, 20, 22, and 24. These originally represented the number of pence per gallon at which the vinegar was sold; and although the price no longer accords with these numbers, the numbers themselves have been retained as symbols whereby a certain quality of vinegar may be known and designated. Vinegar pays to government a duty of 2d. for every gallon of 'proof,' proof being deemed that degree of strength which contains five per cent, of pure acetic acid, as ascertained by an instrument called an 'acetometer,' which acts on the principle of determining the specific gravity of the vinegar when saturated with hydrate of lime, and deducing the acetic strength therefrom. Vinegar varies considerably in its strength under different circumstances, and the duty paid always bears a strictly relation to the strength: thus, if the quantity of pure acid in a gallon of vinegar be double of the 'proof,' then it pays double duty, or 4d. per gallon, and so on. The strength of vinegar is more difficult to ascertain than that of spirit, for there is a kind of mudicle or extractive matter in it which increases its specific gravity, and which is very different in quantity at different times. Hence a given specific gravity will not, as in spirit, indicate the strength; and the test employed is the specific gravity after it has been saturated with hydrate of lime. Up to the year 1834 there were seventy-seven thousand dealers in vinegar in Great Britain, every one of whom was visited once a month, to see that he conformed to cer-

The use of British wines, or, as they are sometimes called, 'home-made wines,' is of very limited extent; and it may perhaps hardly have occurred to the reader that the manufacture is carried on on anything like a considerable scale. Such is, indeed, the fact at the present day; but still there are circumstances attending the rise and growth of this branch of trade too curious to be passed unnoticed.

It is perhaps pretty generally known that nearly all foreign wines are made from the juice of the ripe grape, and that the variations in quality and appearance depend partly on the species of grape, partly on the soil where it is cultivated, partly on the state of the climate, and partly on the method of vintage. British wines, however, are made either from dried fruit or from common English fruits. At first the name of 'sweets' was confined principally to the varieties of raisin-wine; but as English-fruit wine was equally subjected to duty, all alike acquired the name of 'sweets.' The Excise definition of sweets is, "All liquors made by infusion, fermentation, or otherwise, from fruit or sugar, or fruit and sugar mixed with other materials;" and until 1834, any person who had any such liquor in his custody, in quantity exceeding one hundred gallons, was deemed a maker of sweets for sale, and subject to Excise survey.

The rise of the British-wine trade was closely connected with the vinegar manufacture, and dates back to about a century ago. At that time—as Hogarth's print of 'Gin Lane,' and other sources of information, amply attest—the scenes of drunkenness witnessed in the metropolis had reached a fearful ex-
tent. The legislature endeavoured by various means to give a turn to the public taste that might lessen the evil; and among other things they held out strong inc-
ducements for the manufacture of sweets, or home-
made wines. For many years, however, although sweets had been reckoned among excisable articles ever since 1696, the manufacture continued utterly insignificant.

It happened about that time that Mark Beaufoy, a member of the Society of Friends at Bristol, who had abandoned his original trade of a distiller from con
scientific scruples, arising out of the prevailing vice of the times, went to Holland to learn the process of malt-vinegar making, and on his return established a vinegar-factory on the site of the once-celebrated Capers' Gardens, near the present southern end of Waterloo Bridge. The works grew in extent and in fame, and were visited many years afterwards by Pennant, who, in his 'London' gives the following paragraph:—

"There is a magnificence of business in this ocean of sweet and sour, that cannot fail exciting the greatest admiration, whether we consider the number of vessels or the magnitude of the vessels themselves. It is not for the purpose of extracting the saccharine and mucilage of the fruit, the liquor was thrown away, and the vinegar made from it, (comprising all the solid parts of the raisin) reserved for use in the vinegar manufacture.

It happened, however, that Dr. Fothergill, the Quaker physician, became acquainted with this waste of raisin-juice, and, after demonstrating how wine might be made from it, advised Mark Beaufoy to commence it as a branch of manufacture. He did so, and entered his name at the Excise as a maker of sweets, and the beverage thus made became so popular that it was only a matter of time before the whole of the British Islands,—that the Commissioners of Excise Inquiry recommended it to be abolished altogether, as not worth the trouble and expense of collecting. Britons, therefore, are not now an excisable article; and there will not in future be data whereby to judge whether the manufacture increases or diminishes.

The manufacture of 'sweets' is one partaking of fewer processes than that of vinegar, and may be described without much difficulty. If we take the 'sweets' in its fullest extent, so as to include all the varieties of British wine, then we shall at once state that the only variety deemed deserving of description here is that of raisin-wine, to which the manufacture was in the first instance confined. All the kinds made from English fruits, such as 'currant-wine,' 'raspberry-wine,' 'elder-wine,' &c., are such housewives' acquaintances, that we need not dwell on the kind of life as to have the real juice of the grape at their table, will probably still, to some extent, look to a substitute less costly than foreign wine and less injurious than ardent spirits.

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other method is to cut the stalk halfway through when the grapes are nearly ripe, and leave them suspended till the watery part is evaporated; the flow of sap is in a great measure prevented from entering the fruit, in consequence of the incision, and whilst evaporation continues to go on undiminished, the grape necessarily becomes dried. Some sorts are prepared by dipping the grapes in a ley, and afterwards drying them in the sun; the ley being formed of water, wood-ashes, and a small portion of oil of olives. Inferior raisins are dried by the artificial heat of an oven.

The raisins acquire very different qualities according to these modes of treatment; but the wine prepared from them by the British manufacturer of sweets may be spoken of in general terms, without reference to specific differences, further than to say that the 'Lexias' produce a dry wine, the 'Denias' a sweet wine, the 'Black Smyrnas' a strong-bodied wine, and the 'Red Smyrnas' and 'Valencias' a rich and full wine. The time when the importer lays in his store of dried fruit is from Michaelmas to Christmas; and from thence to spring, or in short during the cool weather, is the principal time for making the wine.

The fruit comes into the hands of the wine-maker in three different kinds of packages—baskets, casks, and boxes—according to the quality of the fruit; but in general the raisins are packed closely together, and form a hard mass. These masses are in the first instance laid on a floor and beaten with wooden mallets, as a means of separating the raisins one from another. Sometimes the agglomeration is so close, that the mass has to be passed between rollers before the separate raisins—or rather the small masses, for the individual separation is not yet effected—are steeped in a vessel with a quantity of water, where they stand until all the fruit, being swelled with the water, rises up and floats on the surface.

When the fruit has risen to the surface of the water, a portion of the latter is drawn from the vessel, by which the mass of fruit necessarily sinks to a lower level. A perforated floor or board is then laid on the top of the fruit in the vessel, and kept down by a weight; and upon this is pumped the liquor which had been previously drawn from the vessel. As the weight keeps the board down, and the board keeps the fruit down, it follows that the fruit has a body of liquid and air below it, which together with the perforations in the board allow the liquid to percolate through to the fruit. This process is repeated from time to time, by drawing off the liquid from beneath the fruit, and pouring it in above, by which all parts of the fruit become equally affected. The extraction which is brought about during this process probably begins at the moment when the fruit has lightness enough to float on the surface of the liquid, and continues throughout the process.

When all the vinous and saccharine matters have been extracted from the fruit by this process, the liquid is drawn off into separate vessels. The fruit, however, is not wholly exhausted by this drawing-off, for a considerable portion of the liquid is absorbed by and mixed up among the spent fruit. To recover this is a point of importance; and the action of pressure is here brought into requisition. In one of the rooms of the factory is a powerful hydraulic press, and also a range of screw-presses, the former or the latter being used according to circumstances. Our concluding cut represents one of these presses while being worked, by which it will be seen that the fruit is being pressed from above, and the screw being turned by capstans. In the first instance a man gets into one of the steeping-tuns, and lades out the spent fruit into baskets, which are carried to the press-boxes and there thrown in until the box is full. A powerful iron bar is inserted in a hole in the screw-shaft, and is then used, capstan-like, to turn the screw and press the fruit, half a dozen men being thus employed. Sometimes the aid of a powerful windlass is employed to turn the screw; and the pressure thus exerted is so great as to reduce the fruit to one-third of its former bulk.

The liquid which is thus obtained is added to that which was drawn off from the steeping-vessels; while the spent fruit, now pressed almost dry, is so far from being valueless, that it constitutes the article rope, so important to the proceedings of the vinegar manufacturer. The steeping is not the only process which is carried on in the large vessels; for after the fruit has been moistened and the saccharine qualities extracted, a kind of fermentation is induced by a leaven or yeast contained in the fruit itself; and it is principally to regulate this fermentation that the liquid is passed so frequently through the mass of fruit. In fact the liquid which is drawn off from the vessels is not merely raisin extract or juice; it is wine in a crude state.

The wine is pumped from the fermenting-tuns into other vessels in the 'wine store-warehouse,'—a large building lined on every side with vats, tuns, and casks of various sizes. Here it is subjected to repeated rackings, by which everything that is capable of being precipitated is separated from it and falls to the bottom of the vessels. Here too all the processes of sweetening, and 'fining' with isinglass, &c., according to the different kinds of wine, are carried on, until the wine assumes the form in which it is sold. It is stored in vats, from which it is drawn into casks for sale to the dealers. There is no 'bottling' department at this factory, the wine being sold 'in the wood,' and the dealer separates it into the smaller portions which find their way into the hands of the consumer.

Here we take our leave of this region of sweets and sours, and thank the proprietors for their courtesy. We have thought that the connexion existing between these two branches of manufacture, both in history and in practice, would render it advantageous to treat of them both in one article, and the firm to which the foregoing details relate is the only single one which affords the facilities for so doing.
THE IRISH CLOAK.—No. II.

Amongst the poorer classes it may be seen one cloak does duty for all the females of the family, as you meet with it worn in every way: the tallest wear it as the tailor fashioned it to be worn; the middle-sized place the part on the head which was intended to rest on the shoulder, allowing the hood to fall back like the Turkish caftan; this is in general very graceful, as the great width of the material allows the folds to fall large and flowing. The children all seem to have the power of using it in different ways; those even of four or five years old, to whom a cloak seems as indispensable as to the elders, are so completely enveloped in its folds as to be nearly lost in them. The boys play the same game with the cloaks and great coats of their fathers, for the dress of the men at the present day is departing considerably from the form of the national cloak, and may rather be described as a great coat with many capes. Ireland is also one of the great markets for old clothes collected in England—you meet with the faded garments of a former day in every direction; and hence the English fashions are beginning to preponderate. A few years ago the camel cloaks with red collars and facings, then fast going out of fashion here, seemed in great favour with the Irish, who appear to have thought one insufficient, as it was not uncommon to see a man without shoes, or stockings, or waistcoat, with two of these cloaks over his ordinary coat, and with all their accumulation of capes, sometimes from two to three on each cloak. In England the first care is to secure the feet and chest from cold or damp—this never seems to trouble an Irishman, as you may see a man patiently driving a pig with his shoes in his hand, no cravat, but with his shirt-collar open, the rain pelting on his face and naked chest; when a button fastened on any one of the six capes on his back, where they are not wanted, would make him comfortable—he never seems to think of it: it would appear to a stranger that the knees of his breeches were left unbuttoned in order to allow the rain, after washing his face and chest, a clear passage down his legs. He carries this accumulation of clothes on his back equally in summer and in winter.

The Irish beggar is altogether a distinct class, and must not be confounded with the vagabond of England, who is generally a beggar only because he is too lazy or too depraved to labour; in Ireland it is not so—the man who from choice or from necessity turns beggar, becomes a member of a new community, which by no means impeaches his respectability; he forfeits nothing, but preserves his caste intact, and in consequence holds up his head as proudly as if he were a
THE PENNY MAGAZINE. [November 5.

ECONOMICAL USES OF THE WILLOW.

Or all the plants which grow in this country, there is perhaps not one applied to a greater variety of uses than the Willow. Others may be and are more important, but for diversity of application the willow is really remarkable.

The term 'willow' is applied to two plants so apparently dissimilar, that it may not be known to every one that they are species of one genus. The willow-tree, and the willows or osiers used in basket-making, are the two kinds to which we here allude; and indeed we can hardly speak of the osier; for the osier has been so divided and subdivided, that it contains, according to Sir J. E. Smith's classification, about a hundred and forty species; according to Schleicher, two hundred and fifty; and according to Koch, two hundred and fifty-four. The willows are chiefly natives of the colder parts of the temperate regions of the northern hemisphere, and of a cool and moist soil. A few species have been met with in Armenia, in China and Japan, in Northern India, in North Africa, in Central America, and in North America, but the temperate countries of Europe are those in which the willow is most extensively found.*

The 'white willow,' or timber-willow, the ornamental or 'weeping willow,' and the osier-willow, may be taken as three types towards which all the species more or less approximate, and these grow to various heights, from one hundred feet down to that of a mere shrub. The nature of the uses to which they are applied by man, depends partly on this broad classification, and partly on properties which the end of August till November; the horses of ed

The leaves and young shoots are wholesome and nourishing to cattle; and in some northern countries they are collected green, and then dried and stacked for that purpose. In France the leaves and young shoots of one species, whether in a green or dried state, are largely used for the same purposes. In Ireland the bark, in some places, is fed entirely on them from the Irish beggar has been celebrated for his wit, his 'cuteness'; we have little faith in this—all communities with plenty of time on their hands have their joint-stock of good things, to be used on occasion;—the soldier, the sailor, the lawyer, the doctor, and the divine—the conductor of an English omnibus, equally with the Irish car-driver, has a traditional property in the jokes of his forefathers—the Irish beggar is similarly situated, he is always the attacking party, he makes his occasion, and he has his joke ready to fit it; but the matter is of the antient fabric, and in all likelihood the first "good thing" you meet on the quay at Kingstown was the last you heard or the last you uttered of the best thing in the manner, which is striking and new to an Englishman, from its open and familiar delivery, unlike what he has heard from such a person, and arising from that person's not being ashamed of his position—he is not offended at a refusal, or at the failure of his joke to extract a fee for himself, but turns round in aid of a applicant more needy or deserving than himself with such earnestness as if he had received a fee for his assistance; and so they go on, till at last, getting desperate, they bring forward the most affecting instance on the roll, and all seem gratified if at length they succeed in securing anything to any one of the party. This was the case with the group at the head of this paper. The mail to Bantry stopped at Bandon, at the time suffering from a depression in a rude state of civilization the twigsof the willow furnishes food by its leaves to the larve of moths, gnats, and certain other insects; and, by its flowers, to the honey-bee. The leaves and young shoots are wholesome and nourishing to cattle; and in some northern countries they are collected green, and then dried and stacked for that purpose. In France the leaves and young shoots of one species, whether in a green or dried state, are largely used for the same purposes. In Ireland the bark, in some places, is fed entirely on them from the end of August till November; the horses so fed are said to be able to travel twenty leagues a day without fatigue. In Sweden, Norway, and Lapland the inner bark is kiln-dried and ground, for the purpose of mixing with oatmeal in years of scarcity. In a rude state of civilization the twigs of the willow are used in constructing houses, household utensils, panniers, harness, boats, fishing-tackle, &c. The twigs are still very generally applied in Russia and Sweden to all these uses; and Dr. Walker, who wrote an essay on willows about forty years ago, states that he has ridden in the Hebrides with a bridle made of twisted willow-twigs, and lain all night at anchor with a cape made of the same material.

The bark is usefully applied in many ways. The peasants of Russia and of the adjacent cold countries weave the bark of the young shoots for the upper parts of their shoes, the outer bark serving for the soles; and they also make of it, tied together with strips of the inner bark, baskets and boxes for domestic purposes. The outer bark of old trees supplies them with a substitute for tiles and thatch. In Tartary the bark is steeped in water, and the fibre, when separated, spun into threads from which cloth is woven. Both the bark and the leaves of the willow are astringent, and the former is sometimes employed in tanning; the bark of one species is also used for dyeing black, in some of the cold countries of Europe. The bark of the willow has been brought into requisition as a medicinal agent, by yielding a substance called salicin; this was discovered by M. Leroux, and has been found very valuable as a cure for agues and low fevers; Majendie states that he has known three doses of six grains each stop a fever. Salicin is in the form of very fine whitish crystals, perfectly soluble in water or alcohol, with a very bitter taste; the manufacturing is very difficult, and about three pounds of bark are required to produce one ounce of this valuable substance.

As a variety of timber, the wood of the larger species of willow presents many useful qualities. It is generally soft, smooth, and light; varying from about twenty-seven to forty-five pounds per cubic foot, the one somewhat under and the other somewhat over

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* See article on 'The Willow,' in No. 640.
half the weight of water. In Pliny's time willow wood was in request for the fabrication of shields, on account of its lightness; and in the present day it is for the same reason preferred for making cutting-boards for the use of tailors and shoemakers. It is used for whetting the fine instruments of corks-cutters and other mechanics: it is in demand for turnery, for shoemakers' lasts, for imitating ebony when dyed black, and for many minor purposes. The wood of the larger trees is sawn into rounds for flooring, and sometimes for rafters; in which situation, when kept dry and well ventilated, it has been known to last upwards of a century. The boards are well adapted for lining waggons and carts, particularly such as are intended for coals or stone, as this wood, from its softness, is not liable to splinter from the blow of any hard angular material. From its property of durability in water, willow-wood is valuable for the paddle-boards of steam-vessels, and for water-wheels. The red-wood willow is much used in Scotland for building small ships, and especially fast-sailing sloops-of-war, by reason of its lightness, planity, elasticity, and toughness. Mr. Mathew, in his 'Treatise on Naval Timbers,' quotes the following as reference to these properties of red-wood willow. 'Four cords of wood, or felloes, were peculiarily fitted for plantimg on the banksof rivers from its softness, is not liable to splinter from the blow are peculiarly fitted for planting on the banksof rivers, streams, for restraining their encroachments and retaining the soil in its place. Some of the species are very valuable as coppice-wood, to be cut down every six or eight years for hoops, poles, and faggot-wood. The white-willow is said to be a 'good nurse' for plantations of timber-trees that are made in moist situations. The shrubby species of the willow make hedges, both in dry and in moist soil; but in the latter, the hedges are of direct value as a support of the trees in their annual shoots in basket-making. As respects ornament, the 'weeping-willow' is perhaps the most graceful of the species. It is a native of the Levant; but it thrives very well in England, if the situation be not too cold, and if it be near water. It runs to a considerable height, and no tree can be more graceful on the margin of a lake or stream. It has been said that the first weeping-willow was planted in England by Alexander Pope, and that the motive for so doing was the following:—Pope, having received a present of figs from Turkey, observed a twig of the basket in which they were packed putting out a shoot; he planted this twig in his garden, and it in time became a fine tree. From this stock all the weeping-willows in England are reputed to have sprung, but the original tree itself was cut down a few years ago.

When all other useful purposes have been served, the willow serves as a substitute for coal. The lopings, branches, and old trunks make a most agreeable fuel, producing when dry a clear fire with little smoke. It is used, too, in a form which has been thus described by Mr. Mathew, in his 'Library of English Agriculture' (Lib. Agr. E. England, p. 347):—"The downy substance which envelops these seeds of the willow is used by some kinds of birds to line their nests, and by man occasionally as a substitute for cotton in stuffing mattresses, chair-cushions, and for other similar purposes. In many parts of Germany this substance is collected for making sheets of willow, and serves as a substitute for coal. The lopings, branches, and old trunks make a most agreeable fuel, producing when dry a clear fire with little smoke. It is used, too, in a form which has been thus described by Mr. Mathew, in his 'Library of English Agriculture' (Lib. Agr. E. England, p. 347):—"The downy substance which envelops the seeds of the willow is used by some kinds of birds to line their nests, and by man occasionally as a substitute for cotton in stuffing mattresses, chair-cushions, and for other similar purposes. In many parts of Germany this substance is collected for making sheets of willow, and serves as a substitute for coal.
into coke would in time be used as a substitute for wood converted into charcoal. This substitution has extended rapidly; so that while in the year 1788 twenty-six, out of eighty-six, iron furnaces in England were heated by charcoal, there were, in 1826, three hundred and five iron-furnaces all heated by coke. Willow-wood charcoal is highly esteemed by painters as a material for crayons.

Perhaps the most important application of the willow is one to which we have yet scarcely alluded, viz. the manufacture of baskets. This will occupy our attention in a future paper, and we will therefore not further notice it here, but will conclude with the following statement by Mr. Loudon of the distribution of the willow-wood charcoal amongst the English iron-furnaces: 'The principal plantations of willows for basket-making in every country are made along the banks of rivers and streams; and in England those on the Thames and Cam are the most celebrated. In both these rivers, and in some others, small islands are frequently planted entirely with willows, and are called “osier holts.” There are many such islands in the Thames between London and Reading. The most extensive willow-plantations in fields are in the fen districts of Cambridgeshire and Huntingdonshire; and perhaps the largest plantation in England is that of Mr. Adnam, near Reading. The principal market for basket-willows is London; but they are in demand, more or less, in every town in the kingdom.'

THE ROACH AND THE DACE.

These two kinds of fish are in many respects alike in their habits, and do not very greatly differ from each other in appearance. "They be much of a kind," says Walton, "in matter of feeding, cunning, goodness, and usually in size." The dace, however, is longer, and not so broad as the roach, and its fins and eyes are of a less brilliant colour, but they both have a handsome silvery appearance. They are now classed by naturalists in the same genus, to which also belong the bleak and minnow, though the minnow differs somewhat from the typical characteristics of the others. Both roach and dace are gregarious, and the two species frequently congregate in the same river. The roach is more widely dispersed in the temperate parts of Europe than the dace, but in this country they are both very common. Roach prefer deep and quiet rivers, and will breed well in ponds; but dace love streams deep but clear, with a gentle current, and do not thrive so well in ponds. By day roach haunt deep water in and near beds of weeds, or under the shade of the trees which overhang the banks. Walton terms this fish the "water-sheep, for his simplicity or foolishness;" but several writers do not coincide with the venerated angler on this point. Roach-fishing, indeed, is excellent practice for beginners; and almost as much quickness and dexterity are required as in fly-fishing. To the more experienced even the fish affords excellent sport: Walton added, "especially the great roaches about London, where I think there be the best roach-anglers." Neither roach nor dace are in much esti-
mation for the table. Hawkins gives the preference to the dace, though it is no great things. They both make good bait for pike, the dace for his silvery whiteness, and the roach, being more tenacious of life as well, is used for night-hooks. Roach are in the best condition in October, and dace in February, though on this point there are different opinions. Both attain a larger size at the end of May, or early in June, and recover their strength in about a fortnight afterwards. Roach ascend the upper parts of the Thames preparatory to spawning; and vast shoals leave Loch Lomond at the same season, and during three or four days are caught on their migration in large numbers. The dace seldom exceeds nine or ten inches in length, but the roach attains a larger size. Mr. Jesse caught a Thames roach which weighed three pounds. Walton thought one of two pounds worthy of special notice. "The Thames," he says, "affords the largest and fullest in this nation, especially below London Bridge."

Punt-fishing for roach by the starlings of Old London Bridge was once a common amusement of the city anglers, which they continued to enjoy to the end of the reign of George III. Sir John Hawkins, in his edition of Walton's 'Angler,' published in 1760, gives an interesting account of their latter-day exploits. "The Thames," he says, "as well above as below bridge, was formerly much resorted to by London anglers; and which is strange to think on, considering the unpleasingness of the station, they were used to fish near the starlings of the bridge. This will account for the many fishing-tackle shops that were the former in Crooked Lane, which leads to the bridge.* In the memory of a person not long since living, a waterman that plated at Essex-stairs, his name John Reeves, got a comfortable living by attending anglers with his boat: his method was to watch when the shoals of roach came down the river, and when he had found them, to go round to his customers and give them notice. Sometimes they (the fish) settled opposite the Temple; at others at Blackfriars or Queenhithe; but most frequently about the chalk-hills near London Bridge. His hire was two shillings a tide. A certain number of persons who were accustomed thus to employ him, raised a sum sufficient to buy him a waterman's coat and hat. The impromptu whereby was 'Himself, with an angler in his boat;' and he brought in his boats to the coat of the time of his death, which might be about the year 1730." In 1760 Shepperton and Hampton were much resorted to by London anglers for roach-fishing. If the respectable old angler who joyfully put his tackle in order when John Reeves announced a shoal of roach at London Bridge could now see half a dozen steam-boats at one time moving between Queenhithe and Blackfriars (no unusual sight), he would easily conclude that his sport in that quarter was destroyed. But he would not at once perceive all the other causes which had driven the fish away, such as improved sewers disgorging the impurities of treble the population of the London of his day, the increase in still larger proportion of manufactories, and the establishment of works he never dreamed of, for converting coal into a gas for lighting shops and streets. Turning to one of the Parliamentary Reports on the state of the water supplied to the inhabitants from the river, he would learn by the evidence of fishermen, that since 1820, flounders eels, roach, smelts, salmon, and other fish were unable to live in that part of the Thames between Woolwich and Deptford, and that at one haul up the river towards Wandsworth, and fifty thousand smelts were brought daily to Billingsgate, and not fewer than three thousand Thames salmon in the season. Some of the boats earned 6d. a week, and salmon was sold at 3s. and 4s. the pound. The fishery was nearly destroyed at the time when this evidence was given. The masters of the Dutch eel-ships stated before the same committee that a few years before they could bring their livewells 'as far as Gallions' Reach, below Woolwich; but now (1828) they were obliged to stop at Erith, and that they had sustained serious losses from the deleterious quality of the water, which killed the fish. Many other facts might be mentioned to the angler of the old school still more perplexing—of salmon brought from Scotland in ships moved by steam, and in such large quantities as frequently to sell at 6d. and 8d. the pound; of the supplies of fish from the coast being conveyed to London in three or four hours by railroads; and that by these means fresh fish, once the most difficult commodity to put into extensive circulation, was now regularly sold in the markets of most inland parts of the country not very many hours after being caught.

CONDITION OF LABOURERS' TENEMENTS IN ENGLAND.

[From Mr. Chadwick's Sanitary Report.]

Every detail of the materials with which the cottage is constructed, and the mode of its construction, deserve, and there is little doubt will obtain, most careful attention, for it is only by considering their comforts in detail that they can be improved, or the aggregate effect on the immense masses of the community can be analyzed and estimated. For example, it has been mentioned that a decided difference is perceptible in the health and condition of workmen of the same class who live in houses made of brick as compared with those living in cottages made of stone. A gentleman who has attentively observed the condition of the working classes in the north of Lancashire, and the north of Cheshire, states that the general health of the labourers in the north of Lancashire is decidedly inferior. This inferiority he ascribes to several causes, and, amongst others, to damp cottages, and—"wood and wattle houses, such as our forefathers built, are the driest and warmest of all; brick is inferior in both these requisites of a comfortable house; but stone, especially the unheued stone as it is necessarily employed for cottages, is the very worst material possible for the purpose. I prefer the Irish mud cottages. The evil arises from two causes. The stone is not impervious to water, especially when the rain is accompanied by high winds; and it sucks up the moisture from the ground, and gives it out into the rooms; but principally, stone is a good conductor of heat and cold, so that the walls cooled down by the outer air are continually condensing the moisture contained in the warmer air of the cottage, just as the windows steam on a frosty morning; besides, the abstraction of heat in stone houses must be a serious inconvenience. The effect of this condensation must be, and is, to make clothes, bedding, &c. damp, whenever they are placed near the wall, and therefore extremely prejudicial to those who wear the clothes or sleep in the beds. Of course I do not attribute all the damp of our cottages in this neighbourhood to the stone; much of it is due to the wet climate, wet
soil, and building so near the ground; but the stone, as a material of building, must bear a considerable share of the blame. I believe, too, it is partly the cause of the very great difference of cleanliness of the Cheshire farming people and ours of the same class. Indeed the Cheshire people were brought up to wooden cottages: brick was of later introduction. The greater facilities and inducements to cleanliness in a dry house would, in the course of time, form a more cleanly people, and superior healthiness would follow. 

Mr. Parker observes, that the construction of the cottages in Buckinghamshire is frequently unwholesome. The stones of which the cottages were built, and their defective construction, are also the frequent cause of the serious indisposition of the inmates. The cottages at Waddesdon, and some of the surrounding parishes in the Vale of Aylesbury, are constructed of mud, with earth floors and thatched roofs. The vegetable substances mixed with the mud to make it bind, rapidly decompose, leaving the walls porous. The earth of the floor is full of vegetable matter, and from there being nothing to cut off its contact with the surrounding mould, it is peculiarly liable to damp. The floor is frequently charged with animal matter thrown upon it by the inmates, and this rapidly decomposes by the alternate action of heat and moisture. Thatch placed in contact with such mud speedily decays, yielding a gas of the most deleterious quality. Fevers are very frequent in the cottages of labouring persons, in the parish and neighbourhood. Next to good drainage and thorough ventilation, the foundation of a cottage is the most important consideration. A foundation, to be good, must not only be sufficiently strong to bear the superstructure, and of sufficient depth to cut off all connexion with the surrounding vegetable mould and that beneath the floor, but also be formed of materials calculated to retain moisture. The best materials for this purpose are concrete and sound bricks partially vitrified in the kiln or clamp. If such bricks be well laid with mortar composed of sharp sand containing no vegetable substances, and the concrete be free from earthy particles, well mixed and firmly thrown together, the admission of damp will be entirely avoided. Such bricks, burnt, impure mortar, and wood, have all a tendency to absorb moisture, which, if once received by such materials, ascends, or creeps up, as it is technically called, by builders, and thus affects the whole building. To avoid this 'creeping up,' builders are in the habit of placing a tire of slate in foundations above the surface mould—a remedy of a temporary character only, for the action of damp entirely destroys slate. Roman cement has also been used for this purpose, but the sand mixed with this material renders it in some degree porous. It has lately been suggested that a course of well-burnt bricks set in asphalt would effectually prevent this absorption of surface-water, and a favourable opinion of this plan has been expressed by two intelligent architects. 

The Rev. C. Walkey, of Collumpton, Devonshire, holds that—"In Berkshire the floors of the cottages are laid with red tiles, called 'flats,' or with bricks of a remarkably porous quality, and as each of these tiles or bricks will absorb half a pint of water, so do they become the means by which vapour is generated. The cleanly housewife, who prides herself upon the neat and fresh appearance of her cottage, pours several pails of water upon the floor, and when she has completed her task with the besom, she proceeds to remove with a mop or flannel so much of the water as the bricks have not absorbed. After having cleansed the cottage, the fire is usually made up to prepare the evening meal, and vapour is created by the action of the heat upon the saturated floor. Thus the means adopted to purify the apartment are equally as injurious to the health of the inmates as the filth and dirt frequently too abundant in the cottages of labouring persons. It is usual to insert in local Acts for the regulation of towns a clause prohibiting the use of straw and similar vegetable substances for roofing; and it appears to me to be desirable that some provision should be made for the rural districts, by which the thatch of cottages, when in a decomposed state, might be required to be removed. In the parishes of Binton, Dorsington, and Long Marston, in the neighbourhood of Stratford-on-Avon, simple continued fever, described to be similar in character to the form of fever which frequently occurs in the autumn, has prevailed very extensively in the winter of 1839. Of 31 patients attacked by it, seven died. Dr. Thompson of Stratford-on-Avon, the physician who visited all the cases by the desire of the Board of Guardians of the Stratford-on-Avon union, observes:—"As almost all the cottages in which there has been fever are thatched, and the thatch in many of them is in a very rotten and insufficient condition, it is not improbable that slow decomposition in the thatch, from the unusual quantities of rain which have fallen, may have been going on, and contributed to the production and continuance of fever. It has been observed by others, I believe, that it is more difficult to get rid of fever in thatched than in slated cottages.' Dr. Thompson also remarks, that in thatched cottages it is not possible to ceil one's house to life and health, and he recommends that this should be done, and that the plaster should be lime-washed once a year." 

The Rev. C. Walkey, of Collumpton, Devonshire, gives instances of the want of provision for ventilation in the cottages of the labouring classes in England, it is observed that—"It is in vain that the workman breathes a pure air out of doors, if on his return to his home he finds an infected atmosphere. Air, which is so necessary to life and health, and which is of the last importance to renew often, especially in small rooms, remains thick and loaded in the abode of the workman, because no currents can exist in consequence of the window being almost always placed alongside the door. The form of the chimney is another great evil in the construction of country cottages. With a shaft very short and very large, it is impossible for the room to get warm, and the heat produced is almost all lost. This form of the chimneys is only explicable by the ignorance of the constructors. However large a fire may be required by the diverse needs of the family, it does not involve the necessity to make the chimney shaft of a corresponding size; on the contrary, the facility with which the smoke ascends is altogether proportioned to the smallness of the latter, as may be seen in the chimneys of stoves, which are always extremely narrow."

The Rev. C. Walkey, of Collumpton, Devonshire, gives instances of the want of provision for ventilation in the cottages of the labouring classes:—"Cottages for the most part are without sufficient ventilation, particularly in the up-stairs apartment, this being almost invariably without a chimney, with a low window, commonly about two feet from the floor, and having no ceiling, therefore the thatched roof, lofty in itself, and full of cobwebs, contains the foul air; and in several instances I have been the means of restoring health apparently by blowing gunpowder in cases where fever has raged for months, the ground-floors being often damp—very seldom above the level of the land."

PLANTS USED IN DYEING RED.

Those who have paid but little attention to the nature of the dyeing process, would scarcely be prepared for the very diverse and heterogeneous ingredients employed by the dyer. There is no particular substance,
whether animal, vegetable, or mineral, called par excellence a ‘dye’: there is no dye-manufactory, where the various materials for dyeing are prepared; nor is there any particular country to which we are indebted for them. The art of dyeing is the result of a successive accumulation of facts derived from actual experiment, the dyer having searched in every direction for substances which will impart a required colour to a given fabric. The nature of the silken, woollen, cotton, and linen textures, which form the chief objects of the dyer’s attention—the two former being of animal and vegetable origin, the latter of vegetable—is stated with different degrees of durability the colouring principles contained in the dyeing ingredients; and hence each kind of fabric has in some measure a group of dye-stuffs peculiar to itself, although the grouping is generally made with respect rather to the colour produced than to the fabric dyed. The mineral substances, generally solutions of metallic salts, employed in dyeing, are very numerous, either to impart colour, to brighten the colours given by other substances, or to fix the dye more permanently to the cloth. The animal substances employed are such as the cochineal insect, the kermes insect, and the lac insect. The vegetable substances, however, form the most important series, and are of the most diverse kinds; some being produced from the plant generally, such as indigo and woad; from the sawdust of the wood of the plant, such as Brazil-wood, sandal-wood, logwood, and fusistic; some from the root, such as madder and turmeric; some from the bark, such as quercitron and birch bark; some from the flower, such as safflower; some from the shoots, as sumach; some from the leaf and stem, as weld; some from the leaves, such as evening primrose, yellow rocket, and rape leaves; some from the juice, as catechu, gall-nuts, &c. Of some of these vegetable dye-stuffs a brief account may not be uninteresting: beginning with those which produce a red colour.

Brazil-wood is the wood of the cesalpina sapan, cesalpina crista, cesalpina vesca, and cesalpina echinata, four lofty kinds of tree growing in Brazil. The wood is very hard, sinks in water, is sweetish to its use as a dye under severe penalties; and not only the taste, and rich in colouring-matter, which is pale when the wood is first cut, but becomes redder by exposure to the air. In Brazil the tree has been for many years past a royal monopoly; the exportation of the wood, except on account of government, being strictly prohibited under the severest penalties. Owing to the improvident manner in which it has been cut down by the government agents, it is now rarely found within several leagues of the coast. Indeed it has been asserted that many of the planters have privately cut down the trees on their estates, and used the timber as fire-wood, that they might not expose themselves to the arbitrary and vexatious proceedings of the government agents.

This kind of wood is valuable to the dyer for the various shades of orange and red which it affords when treated with different chemical agents. When boiled in water for some time, the wood furnishes a fine red decoction; and a further portion of red may be extracted from the residue, by the application of alkalis. Alcohol or ammonia will extract a deeper red than that by water; and red obtained by adding acids, such as the sulphuric and nitric, to the watery decoction. Solutions of alum and of tin are very valuable in connection with the Brazil-wood, for they give a fine red precipitate in great abundance, while the supernatant liquor is red also; and when nitro-muriate of tin is added to the decoction, the whole of the red colouring-matter is precipitated.

Brazil-wood is employed in the manufacture of red

nk, and also, but not to a great extent, in dyeing. It has, however, within the last few years been almost superseded by a wood brought from Africa called camwood, which is richer and gives a finer colour than the Brazil-wood.

Logwood is much more extensively employed than the two kinds just alluded to. It is the wood of a tree growing in Jamaica, and on the shores of the Bay of Campeche, called botanically the hematoxylo Campechanum. This tree is something like the white-thorn, but a great deal heavier. The wood is hard, compact, dense, and of a deep red colour, internally, which it gives out both to water and to alcohol. Logwood is brought to this country in logs of about three feet in length, which are reduced to fragments before they are fitted for the use of the dyer. The reduction is effected in one of three ways. One method is by using a machine consisting of knives fixed to a large wheel; the knives chip the wood across the grain into small fragments, which are afterwards reduced to a fine powder by grinding them beneath a pair of rolling-stones. The second method is by a machine provided with steel bars with a great number of notches or teeth at the edges; these rasp and cut the end of the wood into powder. The third mode is by means of a circular saw, which at every cut produces as much logwood as is equal to its own thickness, and is at the same time so coarse; some of the particulate is thus reduced into fragments the thin laminae produced by the saw. The rasps or fragments of logwood obtained by any of these methods will easily yield their colouring-matter by boiling; and this colour is employed either to dye of a reddish tinge, or to brighten the tints given by some other ingredients, or to effect the former as a protective to the latter. The vegetable dye-stuffs a brief account may not be of Logwood:—“Logwood seem to have been brought in insect, the kermes insect, and the lac at the edges; the serpents chip the wood across the grain into small fragments, which a latter of vegetable origin—issuch asto compact, dense, and of a deep red colour produced thantothefabric dyed. These substances generally solution of metallic salts, employed in dyeing, are very numerous, either to impart the dye more permanently to the cloth. The animalsubstances employed are such as the cochineal insect, the kermes insect, and the lac insect. The vegetable substances, however, form the most important series, and are of the most diverse kinds; some being produced from the plant generally, such as indigo and woad; from the sawdust of the wood of the plant, such as Brazil-wood, sandal-wood, logwood, and fusistic; some from the root, such as madder and turmeric; some from the bark, such as quercitron and birch bark; some from the flower, such as safflower; some from the shoots, as sumach; some from the leaf and stem, as weld; some from the leaves, such as evening primrose, yellow rocket, and rape leaves; some from the juice, as catechu, gall-nuts, &c. Of some of these vegetable dye-stuffs a brief account may not be uninteresting: beginning with those which produce a red colour.

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Brazil-wood is employed in the manufacture of red
they are semi-transparent, of a reddish colour, have a strong smell, and a smooth bark.

The madder plantations of Holland are thus conducted:—In autumn they plough the land and lay it up in high ridges, that it may be mellowed by the winter's frost. In March it is ploughed again, and laid in ridges eighteen inches asunder and a foot deep. Then, in the beginning of April, when the madder begins to shoot out of the ground, they dig up the old roots, and take off all the side shoots, which extend themselves horizontally just under the surface of the ground. These they plant immediately on the tops of the new ridges, at about a foot distance from each other; and this they usually do in showery weather, when the plants immediately take root, and require no more water. At Michaelmas time, when the leaves have fallen off, the roots are taken up, and dried for the market. The plant grows to about three feet in height; but it is the long spreading fibrous root which is used in dyeing.

The madder is imported into England either in the state of root, as just described, or in a more advanced stage of preparation. The latter is generally the case with respect to the Dutch madder; and the mode of preparation is as follows:—The roots, as soon as they are gathered, are put under a shed or in a granary or other sheltered place, and there remain exposed to a current of air for ten or twelve days, till they are quite pliable, and till no juice can be pressed out by squeezing them. They are then further dried, either in a common oven of slack heat; if the quantity be small, or in a room between the hands, and heated with turf. When the roots are quite hard and brittle, they are laid on a threshing-floor, and heated with a flail, in order to separate the dirt and outer thin skin. They are afterwards ground in a mill, and the powder, being sifted and sorted, is carefully packed in large barrels, and in this state is purchased by the dyer.

In France the cultivation of madder is principally confined to a district of which Avignon is the centre. The prices vary so much, that the cultivation is subject to much fluctuation; for if any cause gives rise to a high price, this induces the agriculturist to devote more of their land to madder, and the increased supply then reduces the price. It is said that, in France at large, the madder is sold between the hands for the price of a potato, and heated with turf. When the roots are quite hard and brittle, they are laid on a threshing-floor, and heated with a flail, in order to separate the dirt and outer thin skin. They are afterwards ground in a mill, and the powder, being sifted and sorted, is carefully packed in large barrels, and in this state is purchased by the dyer.

In the cultivation of madder in Holland the ordinary root is one which consists of the interior, pure, and bright parts of the root; and the 'crops' is another variety nearly analogous to it.

Safflower is another vegetable substance yielding a red dye, and the last which we shall notice. It is sometimes called bastard saffron, and consists of the flower of an annual plant growing in India, Egypt, America, and some of the warmer parts of Europe. The flowers, which are sometimes sold under the name of saffron, are the only parts employed in dyeing. They yield two kinds of colouring-matter: one soluble in water, and producing a yellow of but little beauty; the other soluble in the fixed alkalies, and affording a red colour equalising in delicacy and beauty that obtained from cochineal, but much less permanent. The colour of safflower will not bear the action of soap, nor even that of the sun and air for a long time; and being very costly, it is principally employed for imitating upon silk the fine scarlet and rose-colours dyed with cochineal upon woollen cloth.

The safflower has been occasionally cultivated in Germany and France, and the process of culture is said to be as follows:—It is sown in the lightest land, which has always a double fallow given to it, first to destroy the weeds, and afterwards to make it fine. After it has been fallowed a summer and a winter, and has been ploughed and harrowed four times, it receives its last ploughing and harrowing in the latter end of March. The seeds are then scattered thinly in drills about a foot and a half from each other, and the earth is drawn into them with a short-toothed arrow; and a roller is passed over the ground to smooth and to settle it. After the plants have come up, they are hoed three times at intervals of five or six weeks; and as soon as the flowers begin to open, the field is gone over once a week to gather such as are ready. There is usually a succession of flowers for five or six weeks, and these are gathered at such times when there is no dew on them.

Hasselquist describes the Egyptian mode of preparing the flowers for use thus:—After being pressed between two stones, to squeeze out the juice, the flowers are washed several times with salt-water, pressed between the hands, and spread out in the open air to dry. In the day-time they are covered, that they may not dry too fast with the heat of the sun, but they are left exposed to the dew of the night. When they are sufficiently dry, they are packed up for sale. Dr. Thomson states:—"From the colouring-matter extracted by means of an alkali, and precipitated with an acid, is procured the substance called rouge, which is employed as a paint for the skin. The solution of carthamus (the botanical name for the safflower) is prepared with crystals of soda, and precipitated with lemon-juice which has stood some days to settle. After being dried on delft plates by a gentle heat, the precipitate is separated, and ground accurately with talc. Which has been previously reduced to a very subtle powder, and on the fineness of the talc depends the difference between the cheaper and dearer kinds of rouge." This rouge appears to be the real colouring-matter of the dye for which the safflower is used by the dyer.

There are a few other plants useful in dyeing red, but the above are the most important. Orchil seems rather to be ranked as a blue or purple than a red dye.

Curious Means of knowing the Position of a Ship in Foggy Weather.—There is a provision there (at Holyhead) for the safety of the packets which attracted my attention, from never having known anything of the kind in my life. The Stag Rock, on which the lighthouse is built, is connected with the mainland by a chain bridge. I was surprised at the number of sea-fowl upon the rock, and asked why they were not regularly fed every day. The harbour-master told me that they were objects of his care and anxiety; for that when the packets in foggy weather could not make out any land, and finding by their lead they were close to the shore, they were in the habit of firing a gun, and at the report the sea-fowl flew up screaming, and thus indicated the position of the packet instantly. I tried that experiment when I was there, and found it answer inimitably.—Evidence of Captain George Evans, R.N., before the Parliamentary Committee on Post-Office Communication with Ireland—Session 1842.
de Foix in Béarn, in 1388, and to the English court a few years later.

Gaston, or, as he was called from his beauty, or his love of hunting, Gaston Phoebus, was one of the last of a class now extinct, in Europe at least,—the sovereign nobles, who were strictly kings in everything but name. He was born in 1331; his parents were Gaston, second Viscount of Béarn, and Eleanor, daughter of Bernard, fifth Count de Cominges. His father dying whilst he was yet a boy, his education was left to the care of his mother, who appears to have done such justice to him that he became one of the most distin-

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No. IX.

THE JOURNEY TO THE COURT OF GASTON DE FOIX.

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remembrance of all things past, and my wit quick and
sharp enough to conceive all things showed unto me
touching my principal matter; and my body as yet
able to endure and suffer pain: all things considered,
I thought I would not let (cease) to pursue my said
first purpose; and to the intent to know the truth of
deeds done in far countries. I found occasion to go
to the high and mighty prince Gaston, Earl of Foix and
de Béarn. For I well knew that if I might have that
grace to come into his house, and to be there at my
leisure, I could not be so well informed to my pur-
purpose in none other place. Be of this remembrance
of the knights and strange squires for the great nobleness
of the said earl." Accordingly Froissart obtained letters of recommendation from
his patron the Count of Blois, and departed. His account of
his journey is inimitable for its delightful ease and
vivacity. The country through which he passed was
one of great interest even then; and modern events
have made it more so: it comprises the scene of
the great Peninsular struggle between the allied British
and Spanish and the French. On his way he called,
among other places, "at the castle of Saverdun, and
so to the good city of Pamiers, which pertained to the
court of Foix. And there I tarried biding for some
company going into the country of Béarn, where the
earl was. And when I had tarried there three days in
the high and mighty prince Gaston, Earlof Foix and of
instrength of body; therefore the Earlof Foix had
Béarn. For I well knew that if I might have that
company going into the country of Béarn, where the
earl was. And there Itarried biding for some
is but a small fire, and the days are very cold." Then Ernal-
ton of Spain went down the stairs, and beneath in the
gallery therewas agreat chimney, and the ass's feet upwards,
whereof the Earl Lys, showing me, whereby I thought my journey
the good knight had characterised them as "right piteous." We shall here
little anticipate Froissart's account of the circumstances, as he
received them at Orthes.

In 1349 the earl, or, more properly speaking, the
count, had married Agnes, daughter of Philip III.
King of Navarre, and sister of Charles the Bad, who
succeeded that monarch. A dispute, it appears, arose
after the marriage, concerning a sum of money, in
which the countess's dowry was concerned, between

Charles and the count, and in consequence between the latter and his wife. At last the Count of Foix sent the countess to her brother to find out money he demanded; and as she could not obtain it, she would not return, saying she durst not. They had one child, Gaston, who "grew and waxed goodly." About the age of fifteen, desiring to see her mother, the count permitted him to go to the Count of Navarre, where he was received by his uncle, Charles the Bad, the king, who, the count said, "incontinent put him in prison, and let him so keep that I may have a reckoning of him." Then the child was put into the tower.

Frenzied by his beloved son's apparent guilt, the count arrested a great number of his attendants, fifteen of whom he put to death "right horribly," and, for the intercession of the Assembly which he caused to meet on the matter, Gaston would have been form-or-saying executed. At last the count agreed that he would only keep him in prison a certain time. As to the poor prisoner, he would eat nothing; he "lay in his clothes as he came in, and he argued in himself, and was full of melancholy." At last one of the attendants went to the count, saying, "Sir, for God's sake have mercy on your son, Gaston, for he is near famished in that prison. I have seen there\" this day all that ever I brought him before, lying together in a corner.\" Of those words the Earl was sore displeased; and, without any word speaking, went out of his chamber, and came to the prison where his son was. And, in an evil hour, he had at the same time a little knife in his hand, and a fair prospect; or a tower of state, for a proud mind to raise itself upon; or a fort or commanding ground, for strife and contention; or a shop, for profit and sale; and not a rich storehouse for the glory of the Creator and the relief of man's estate. Lord Bacon.

3 L 2
COLOGNE.

The fervent admiration with which the Rhine is regarded by Germans is a just tribute to its natural beauties, and still more to the stirring events which are associated with the noble river. The vineyards mirrored on its bosom, and all the varied beauties characteristic of the "scenery of the Rhine," would not be half so inspiring if its castled crags and ancient towns were not rich to overflowing in the legends of antique romance. Here the old Roman civilization irradiated the darkness of the wild forests, and the more benevolent influences of modern civilization were fostered and developed. Few of the ancient cities of Europe can trace their origin so distinctly as Cologne. It was a Roman station, and subsequently a "colonia," under the name of Colonia Claudia Agrippinensis, from the Emperor Claudius and his wife Agrippina, who was born here while her father, Germanicus, commanded in these parts. Agrippina adorned it with an amphitheatre, temples, aqueducts, &c., the ruins of which may still be traced. No spot on the banks of the Rhine exhibits so many Roman vestiges. A great part of the wall which extends along the river is Roman, and also one of the gates. Some of the streets still bear Latin names. Many busts, sarcophagi, and stones, with the numbers of the legions stationed here, have been dug up, and with other relics are placed in a public museum. It has been doubted whether the Emperor Constantine erected a bridge across the river at this spot. The story is, that it was destroyed in the tenth century by Otho the Great, Emperor of Germany, and that the piers are now occasionally visible. Between Cologne and the opposite bank of the river there is now a bridge, erected in 1822, which rests upon thirty-nine pontoons, and rises and falls with the tide. It is a favourite promenade in fine weather. Vitellius was proclaimed emperor at Cologne. Trajan was here when nominated by the Emperor Nerva as his successor. Several of the Roman emperors resided for some time, and Sylvanus was assassinated, at Cologne. It continued to be the capital of Lower Rhenish Gaul until the fourth century, when it was sacked by the Franks, who were now harassing the Roman power; but it was retaken. In 460 the Franks once more obtained possession, and kept it. Clovis, their king, was proclaimed here. After a frequent change of masters Cologne was annexed to the German empire, and in 949 was constituted an imperial free city. The Roman municipal constitution might be traced down to the period when Cologne, in 1792, ceased to be a free city. It is now the capital of a Prussian province, and contains about sixty thousand inhabitants.

In the early part of the fourteenth century, Cologne, where the grander part of the Rhine commences, was called the "Rome of the North." It was then the seat of the greatest wealth and civilization on this side the Alps. Petrarch visited it in 1333, and, writing to his friend Cardinal Colonna, he exclaims, "How glorious is this city!" and he commends the taste of its inhabitants for literature and the refinements of life. Cologne was at that time the principal town of the great Hanseatic League, which it had joined in 1201, and had grown rich by industry and an extensive commerce. It could muster an armed force of thirty thousand men, and its population amounted to one hundred and fifty thousand souls. Even in the eleventh century the vessels of the Colognese carried Rhenish wines, corn, flour, malt, beer, linen, and other German produce to all countries lying on the German Ocean and the Baltic, to England, France, Spain, Portugal, Italy, Norway, Sweden, and Russia, and brought back the productions of those countries. King John granted extraordinary privileges to the merchants of Cologne who traded to England. Whitehall was assigned to them exclusively for the Rhenish trade. They had factories also in Norway and the Netherlands. In those days the Colognese carried matters with a high hand. They obliged all vessels navigating the Rhine to unload their cargoes
at Cologne, whence they were conveyed in its own
ships. In 1452 Cologne was formally excluded from
the Hanseatic League, having taken the part of Eng-
land, against which the League had declared war; but
it was not until 1474 that it was re-united. While
commerce flourished, the arts and sciences were equally
vivorous. The University of Cologne was the most
famous in Germany. The specimens of architecture,
paintings on glass, sculptures, and pictures, which still
exist, attest the perfection which the Cologne artist had
attained.

At a later period Cologne has been celebrated
chiefly for its "monks and bones,"—the number of
its ecclesiastics, and the relics of its churches. In
1646 a local historian, after mentioning the city wall,
with its eighty-three towers and thirty-four gates, gives
the following account:—"In Cologne there be eleven
colleges of canons, twenty-seven monasteries, thirty-
two nunneries, together with a great many convents
of Beguines, and several houses for religious old ladies
not professed; nineteen parish churches, ten churches
attached to religious houses, thirty chapels; two great
hospitals, or, more properly speaking, hosteries, for
destitute travellers; two hospitals for the cure of the
sick poor, and eight poor-houses for the permanent
abode of destitute old persons and orphans. There are also
a foundling hospital and a lunatic asylum. It hath as many steeples as there be days in the year;
and twenty-five thousand of its inhabitants are
of the ecclesiastical condition." This unfortunate
preponderance of one class has not been a fortunate in-
gredient. The archbishopric, together with the tem-
ple, the principal city towers, and some of the clergy
were given to his brother, who was the first Elector of
Cologne. Probably the rights and duties of the Co-
lognese and their civil and ecclesiastical ruler were
never well defined, but at any rate they seem scarcely
ever to have been at peace with each other. The right
of taxing the inhabitants was one of the disputed points.
Each party had its faction, and intrigues and ma-
novements were practised, so that one faction might
be played off against the other. Thus disunion was
created between the patrician and plebeian classes,
though cases sometimes occurred when, for the sake of
their common interests, they joined in opposing the
pretensions of the archbishop-electors. It was chiefly
at the instigation of the ecclesiastical population that
the Jews were expelled in 1455, to the number, as it
is said, of forty, which Sir George Strickland, in his
Nevirves, was informed by a Jew who had lately
been expelled. In 1455 the Jews were expelled.

Soon afterwards, after some disturbances in
which they had taken part, the weavers were driven
out, and nearly two thousand looms were burnt by the
order and in the presence of the magistrates. The
weavers transferred their industry principally to the
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supply of osiers from Holland and France; but when, during the revolutionary war, the freedom of commerce between the countries was interrupted, attention began to be more particularly paid to the culture of this plant in England. Very little was known of the matter in England, and less in Scotland; and thereupon the Society of Arts offered premiums to those cultivators who should raise the greatest quantity of osiers (not being less than six thousand plants) per acre. A great impetus was thus given to this branch of agriculture; and Mr. Borron of Warrington, Mr. Wade of Suffolk, Mr. Phillips and Mr. Bull of Ely, and Mr. Sherreff of Haddington, made considerable plantations. It became an object with these cultivators to ascertain, not only the quantity that could be obtained, but the quality of the produce, since many plants which pass under the name of osiers, and possess their external characters, are ill adapted for the work intended. Mr. Phillips showed that the best kind for basket-making is the 'grey' or 'brindled' osier, having a light-coloured leaf, and streaks of red or blood-colour in the bark; it grows vigorously, is very hardy and reaches many of the districts where osier-kinds flourish in the most barren kind of peat; but they are coarse and spongy, have a thick pith, and are very perishable, and are only fitted for the coarser sort of baskets. The best species for the finer kind of work is called the French willow; it is rather of slow growth, but extremely taper, plant, close-grained, tough, and durable. This kind is still procured in large quantities from the Continent, since the attention of English growers is more directed to the less delicate species.

The transactions of the Society of Arts, and various agricultural publications, contain many discussions and conflicting opinions as to the best mode of cultivating osiers; but we shall here merely give a very few of those recommended by Mr. Sacy, in his 'Kalendar.' The soil for basket-willows ought to be deep, well-drained, and thoroughly prepared; the situation low, level, and naturally moist; and the supply of water, for irrigation, plentiful. There are few soils that will not bear willows; but dry and exposed grounds, peat-moss, and land covered with standing water, are unfitted for them. Hollows, the soil of which is composed of rich earth, consisting of decaying and peat, which can be laid dry, form the best osiers, especially if they can be occasionally soaked with water during the summer months. The osier-ground must be well provided with drains, and prepared with manure as carefully as for a crop of wheat or barley. Mr. Sacy, as well as other agriculturists, dwells forcibly on the error of supposing that osiers are an aquatic plant which will grow vigorously in any moist soil; they may do so, it is true, but the production of fine osiers fit for the basket-makers can only result from careful management.

The ground being prepared, the next thing is to procure the plants. These should be of the last year's wood, or of shoots one year old, taken from the under-end of well-ripened shoots of good size, and cut in a slanting direction with a sharp knife, in lengths of about twelve or fifteen inches. Every vigorous shoot will afford two or three plants; and the upper end of each, as far as it appears soft, being unripe, is discarded. The distance at which these basket-osiers are planted apart is about eighteen inches between the rows, and twelve inches in the rows; to be thinned afterwards. Osier-plantations should be carefully hoed and cleaned every year, about the month of March or April. The best season for cutting the osiers is said to be the autumn, after the fall of the leaf; because the buds which are left to produce the shoots for the succeeding crop immediately begin to swell, and grow in strength during the winter, and consequently they make much earlier and stronger shoots in the following spring. Immediately after cutting the rods they are tied up in bundles, each generally about an ell in girt; and if they are not intended to be used green, that is, with the bark on, they are set on their thick ends in standing water to the depth of three or four inches. Here they remain during winter and spring, till the shoots begin to sprout, which, in the neighbourhood of London, generally happens about the end of February. Sometimes it happens that osiers are cut with the leaves on, in which case they are not tied up in bundles, on account of the fermentation that would be produced by binding them closely together in that state; but they are set up thinly and loosely on end, their tops leaning against a rod supported on two props.

Mr. Loudon states that in Cambridgeshire, when a basket-maker purchases green rods, he measures the bundles or bolts by a band an ell long, or a yard and a quarter; which band, previously to tying it round the rods, he marks at the point to which the given quantity extends. The extent of the bands is governed by the quantity of green osiers and basket-makers call for, as it appears large enough to fill the band, and afterwards completes the bundle by pushing under the band as many rods as he can; for this purpose the large rods are laid aside, from their filling up the given space more quickly than the smaller ones. Three bands are bound round each bundle, one towards each extremity, and one in the middle, the one nearest the lower end being the largest, and so the bundles are wedged close by tying up a small armful (called acaf), and placing it in the middle of the bottom of the bundle, and then driving it up into the middle of the bundle by striking the end against the ground. A machine called a 'dumb-boy,' made of wood and rope, is used by some purchasers for compressing the rods, and the given number of rods into a bundle; and another machine, called a 'cow,' is used with still greater effect for this purpose. This is a curious example of the effect produced when an article sold by the bulk is made up into parcels by the buyer and not by the seller: it is easy to see how this system affects the mode in which the bundles are packed. Common green osiers sell at from eighteenpence to three shillings per bundle.

For finer work the rods are 'peeled' before being made up into bundles; a simple operation generally done by infirm old people at so much per bundle. The apparatus for peeling consists of two iron rods, about sixteen inches long and half an inch thick, tapering a little upwards, and welded together at the end, which is sharpened. When the instrument is inserted in a piece of firm ground, the peeler sits down opposite to it, takes the willow rod or twig in his right hand by the small end, and puts a foot or more of the thick end into the instrument, the prongs of which he pressures together with his left hand, while with the right he draws the willow towards him, by which operation the bark is at once separated from the wood: the small end is then treated in the same manner, and the peeling is completed. Another mode is to fix a plank on legs at a convenient height, so as to form a stool or small bench, having holes bored in it; into these is put a stick with the upper end cleft, and through this cleft the willow twigs are drawn to separate them from the bark.

For a rod being peeled, the willow-rods will keep in good condition for a long time, till a proper market is found for them. They are tied up in bundles rather smaller than those of the green rods, and in this state sell in the London market at from five to seven shillings per bundle; being reckoned in the large way by the 'load' of eighty bundles, the green rods being sold
by the score of bundles. It is one particular species only of the willow, whether with or without the peel on, which is generally known by the name of 'osier' in Covent Garden market; all the other kinds used for similar purposes being known as 'willows.'

The occupation of making baskets from the willow-twigs thus produced is sufficiently simple when no beauty of appearance is required. In most parts of Europe it was formerly understood by every country laborer, and two or more secondary ribs are introduced; and this process is continued till a sufficient number of subordinate ribs are put in to support the wattling or weaving of the entire structure. The distance of the subordinate ribs apart at the widest part may be from three to four inches. When the form of the basket is a square or parallelogram, exactly the same process is pursued; but greater care and skill are required in bending both the main ribs and the subordinate ribs to the required forms, the rod being often split for this purpose, and laid with the pith-side inwards.

Another Scotch mode is, to lay two stout osiers on the floor, at right angles to each other, and to weave around them one or two smaller osiers, as a nucleus in which to insert the ends of other ribs, which are extended in different numbers and directions, according as the basket is to be circular, oval, or rectangular. But the bottom is not cut up the sides; but the interest is turned upwards, and the work continued in a perpendicular direction as high as required. A horizontal rod, or rim, is then made fast to the upright ribs by wattling, and a handle is added if necessary.

A common English mode is, to begin by laying three stout osier-rows on the floor, parallel and in contact, and three others above them at right angles, all six being cut to a length a little exceeding the diameter of the basket. The basket-maker now puts his foot on the centre of intersection of the six rods, and interweaves smaller rods around and among them in a spiral form, opening the six rods from time to time, so that ultimately they stand out equidistant, like the spokes of a wheel. The wattling being carried on to the full diameter of the bottom, the latter is now turned upside down, and, the points of the radiating ribs being cut off, a willow rod is inserted on each side of each rib, and turned upwards. These upright ribs become a warp, into which smaller rods can be woven to form the side of the basket. The upper ends of the rods are finally brought down and plaited into a sort of rim or eave, and a handle is then attached if necessary.

All these methods are for baskets of the commonest kind; but they involve the simple principles whereon, when modified, all basket-work is conducted.

### HORSES IN THE EAST, AND THEIR TREATMENT.

[From the "Pictorial History of Palestine."]

**CAPTAIN Frankland** in his *Travels to and from Constantinople,* states that the horse of Syria is generally about fifteen hands high, strong and active, mostly of Syrian dams by Arabian sires; the price varying from four hundred to one thousand piastres. "They are always in good condition, and the weanling begins to showy; but they are beautifully limbed, more hardy, and reckoned much fleeter. They become exceedingly attached to the groom, and will follow him as a dog follows his master." Burckhardt informs us that there are three breeds of horses in Syria:—the true Arab breed, the Turkman, and the Kourdy; which last is a mixture of the two former.

The Turkman horses, being of a larger size, or stronger make, and more martial appearance, and when dressed displaying the Turkish trappings to more advantage, are preferred by the Osmanlis to the Arab horses. They are taught to walk gracefully in a crowd, to set off at once full speed, to turn on either hand at the gentlest touch from the rider, and to stop short instantly when he pleases. But the horses in Syria are mixed so well bred that the ménage, or have such splendid action, as those of Cairo.

The Arabian horses are of more slender make, and —it may startle some to learn—in appearance less showy; but they are beautifully limbed, more hardy, and reckoned much fleeter. The esteem they are held in by the Arabs themselves, the scrupulous care taken to preserve the purity of the breeds, and the resistance with which the Arabs consent to part with their mares, are circumstances often mentioned by travellers. The Rev. V. Monro, in his *Summer Ramble in Syria,* relates that on the visit to the river Jordan one of the Arab escort, "a great ruffian was
mounted on a white mare of great beauty. Her large fiery eye gleamed from the edge of an open forehead, and her exquisite little head was finished with a pouring lip and expanded nostril. Her ribs, thighs, and shoulders were models of make, with more bone than commonly belongs to the Syrian Arab; and her step often received admiration, dignity from that aristocratic set on and carriage of the tail which is the infallible indication of good family. . . . Having inquired her price, I offered the sum, whereupon the dragon asked one-third more. After much bating and debating, I acceded, and he immediately stepped back in the same proportion as before. This is invariably the case with the Arabs. It has been reported to me repeatedly in hiring horses, that, if the terms have been agreed upon without two days being occupied in the treaty, they imagine more might have been obtained, fly from the bargain, and increase their demand. I therefore discontinued my attempts to deal. The Arab said he loved his mare better than his own life; that money was of no use to him; but that when mounted upon her he felt rich as a king. Shoes and stockings he had none, and the net value of his dress and accoutrements might be calculated at something under seventeenpence sterling."

D'Arvieux has an interesting chapter upon Arabian horses, in the course of which he mentions that there are partnerships in valuable mares. "A Marseilles merchant," he goes on to say, "was thus partner in a mares of an Arab, whose name was Ibrahim Abou Vouasses. This mare, whose name was Touysse, besides her beauty, her youth, and her price of twelve hundred crowns, was of the first noble race. That merchant had her whole genealogy, with her descent both on the sire and mother's side, back for five hundred years, all from public records. Ibrahim made frequent journeys to Rams, to inquire of news of that mare, which he loved extremely. I have many a time had the pleasure to see him cry with tenderness, while he was kissing and caressing her; he would embrace her, would wipe her eyes with his handkerchief, would rub her with his shirt-sleeves, and would give her a thousand blessings during whole hours that he was away. My eyes! woe is me! My soul! my heart! Must I be so unfortunate as to have thee sold to so many masters, and not be able to keep thee myself? I am poor, my gazelle! You know well enough, my sweet, that I have bought thee up like my child. I never beat thee, never chid thee; but did cherish thee as the apple of mine eye. God preserve thee, my dearest! Thou art beautiful! thou art sweet! thou art lovely! and Basra to send to India. The Arabs themselves embrace her, would rub her eyes with his handkerchief. The Arab greatly prefers to ride mares rather than horses, the greater proportion of which they sell to the townspeople; and as it happens that the Turks prefer horses, this differing taste acts exceedingly to the buyer's disadvantage. The Arabs, as a rule, have a long time; Mr. Burckhardt's time (1810-1816), from 10£ to 12£; the latter price being the highest known. An Arab mare can scarcely be obtained under 60£; and even at that price it is difficult for the townspeople to purchase one. Prices have risen considerably since the English have been in the habit of purchasing Arabian horses at Bagdad and Basra to send to India. The Arabs themselves often pay as much as 200£ for a celebrated mare, and even such a price as 500£ has been given—a prodigious sum, considering the scarcity and consequent high value of money in Western Asia. Burckhardt mentions a sheikh who had a famous mare, for the half of which he gave 400£."

[To be continued.]
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THE HAWTHORN.

Mr. Loudon, in his "Arboretum," confesses himself an enthusiastic admirer of the "Crataegus" genus, and asks if any other could afford so many resources if a man were exiled to an estate with permission to choose only one genus of ligneous plants to form all his plantations, shrubberies, orchards, and flower-gardens? The most complete collection of the genus is in the arboretum of the Messrs. Loddiges at Hackney, which contains eighty sorts. At Somerford Hall, Staffordshire, there is a collection nearly as complete, made by General Monckton, a great admirer of the genus. The blossoms of each species and variety are generally in great profusion, and in most kinds are particularly fragrant. The fruit varies greatly in size and colour. In one species it is as small as a grain of mustard-seed, while the Mexican thorn bears yellow fruit as large as a golden pippin. The fruit of the azarolus thorn is eaten in Italy, and that of another kind is sold in the markets of Montpellier. The flowers of the common brier-rose are distinguished by the same characteristics as the hawthorn-blossom, and the thorn genus is closely allied to the Rosaceæ and to the apple-tree. Some of our cultivated fruits have almost as humble an origin as the common haw of the hedges. One species of thorn is evergreen, and is often seen planted against the walls of houses, which it enlivens in autumn by its scarlet berries, and in winter by its perennial foliage.

The common hawthorn (white-thorn, May, or May-bush) is as redolent of poetical associations in England as the rose in the East. It is connected with the festivals of old English rural life, with May-day celebrations and dances round the Maypole, and all open-hearted pleasures of merry England in other times. A floral holiday betokens a poetical taste for nature and a freedom from griping and sordid cares, which, looking back upon the times when such days were celebrated, seems to give them a tinge of the golden age. We borrowed the May-day games from the Romans, who, as well as the Greeks, honoured the May-blossom in their floral celebrations. There are about twenty-nine varieties of hawthorn, and the species grows wild in every part of Europe. In France it is often called l'épine noble, from the belief that it furnished the crown of thorns planted on the brow of our Saviour. The spine, or thorn, often disappears by cultivation, as it has done in the pear-tree, which, in its wild state, is armed with thorns. Mr. Loudon says,—"In the environs of London we have observed the scarlet-flowered variety repeatedly in hedges, and also varieties with variegated leaves, with woolly fruit, with yellow fruit, and with pendulous shoots. As to varieties in the leaves, they are endless; and the same may be said of the size and of the hardness or fleshiness of the fruit." The reason is, that many millions of plants have been raised from seed in nurseries, and those which evinced any peculiarity have been kept apart and propagated by grafting. The varieties with scarlet or pink flowers are very beautiful objects on a lawn. There is a variety with red petals and white claws; a later variety has the petals wholly red, and
the flowers very large; and another, not often seen, has double flowers of scarlet. The variety which bears double white flowers is very beautiful, and the petals in fading become tinged with a delicate pink tinge. The Glastonbury or early-flowering thorn is another variety, and is remarkable for the season at which its blossoms are produced, and for the legend connected with that. This thorn must not, however, be exclusively considered as a plant for hedges. It is entitled to be considered as a tree of the second or third rank. They are found with trunks varying in height from four to upwards of ten feet, and a total height of forty-five feet, some of which are growing wild, and others have been nurtured by cultivation. An old thorn at Duddingstone, near Edinburgh, which was measured in 1836, at the request of Mr. Loudon, was forty-three feet high; the diameter of the space over which the branches extended was forty-four feet; the circumference at three feet above the root, nine feet and a half; and a little way above the root, ten feet and a half. Mr. Selby, in his recent work, says that at Jardine Hall, Dumfries, there is a thorn, planted in 1708, and the thorns that are said to be ancient and venerable, according to the monks of Glastonbury Abbey, that Joseph of Arimathea visited this country for the purpose of converting the inhabitants; and at Glastonbury, as a proof of the divine authority of his mission, he planted his staff into the ground, which immediately burst forth into branch and blossom. The blossoming of the tree on Christmas-day was regarded as a confirmation of the legend. The old thorn is said to have been destroyed by the Puritans, but a descendant remains. In 1833 Mr. Loudon received a branch from it, gathered on the 1st of December, which bore both blossoms and ripe fruit, and his correspondent stated that it would flower again in May. In the following year Mr. Loudon received a branch of the Glastonbury thorn from the Botanic Garden at Oxford, which displayed fully expanded blossoms and ripe fruit. Mr. Loudon says that the trees of this species in the gardens of the Horticultural Society and at Messrs. Lodges' flower sometimes in December, and sometimes not until March or April.

The hawthorn is said to have been used by the Romans in England for forming hedges, and we know from books that it has been so employed for at least four hundred years. Plants of the hawthorn were collected in the woods, and hedges were made with the addition of the holly, the sloe, and some other species; but for a long period it would only be the land immediately surrounding the dwelling-place, and gardens, and plantations that would be enclosed with hawthorns. Mr. Selby says that in Northumberland and other parts of England north of the Tees the greatest proportion of quickset-hedges have been planted within the last eighty years. Nurseries for quicksets were not established much before Evelyn's time, that is, about two hundred years ago. The immense number of enclosure acts within the last eighty years occasioned an enormous demand for hedges, and the raising of tender green and its delicate leaves with the brighter and deeper masses of the holly and the alder. The story was, according to the circle overspread by its branch is nearly fifty feet. The form is elegant and picturesque, with falling or slightly pendulous branches. Mr. Jesse says that the old thorns in Bushy Park are most probably above two centuries old. He points out a remarkable property in the thorn. "As they increase in age they have the property of separating themselves into different stems, some having four or five, and even six, which, as they separate, become regularly barked round, forming to appearance so many distinct trees closely planted together, except that they all meet at the 'butt' of the tree. Some of the thorns are now undergoing the process of separation, having already thrown out one stem; while in other parts they are complicated with stems down to the butt. The hawthorn requires a good soil for the full development of its size. The wood is hard and firm, close in grain, and susceptible of a fine polish. It is used for cogs in mill-wheels, for shafts, handles for hammers, mallets, &c. It makes excellent fuel, and burns as well when green as in a dry state.

Some controversy has been maintained as to the claim of the hawthorn to the title of a tree; but even if it could be pronounced the reverse, the natural associations connected with it as one of the blooming heralds of summer, and other sentiments which it awakens, would render it a favourite. Gilpin alleged that it was a round, heavy, and matted bush, and that its blossoms were too profuse. This may often be the case at Jardine Hall. But Sir T. Dick Lauder says that the hawthorn is not only an interesting object by itself, but produces a most interesting combination or contrast, as things may be, when grouped with other trees. We have seen it," he says, "hanging over rocks, with deep shadows under its foliage; or shooting from their sides in the most fantastic forms, as if to gaze at its image in the deep pool below. We have seen it contrasting its green with the grey of some stately oak, or standing height and breadth the country would be such as those only can form an idea of who have seen the collections at White Knights, near Reading, when the trees are in flower and when they are in fruit." We believe, however, the road-makers would protest against such a practice. Mr. Selby speaks of the fine effect produced by large and ancient thorns in the ravines near Pease Bridge, on the great northern road. Here they are mixed with a few detached and gnarled oaks, and the vacant spaces enriched with the golden blossoms of the

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whin." In the northern district in which he resides, the hawthorn, he says, is one of the greatest accessories to the beauty of the dunes and ravines.

PLANTS USED IN DYEING BLUE.

The ingredients for producing a blue dye have, like many others of the materials of manufacture, been the subject of much bitter discussion and much bustle in legislation, according as the growers of one kind gained the ascendancy over those of the other. Woad and indigo are the materials here alluded to; which, together with orchil or archil, constitute the three principal plants for imparting a blue or purple dye to woven fabrics.

Woad is a plant cultivated in Lincolnshire and some other parts of England, as well as on the Continent, for the sake of the leaves, which, after being properly manufactured, are used as an ingredient in dyeing blue, and as a basis for black. It is a biennial plant, with a strong thickish fibrous root, which penetrates deep into the soil. The flowers are yellow; and the stem, which rises to four or five feet in height, is subject to very great vicissitudes of growth, for it may be stirred less frequently, without watering, and at length devoured in the space of twenty-four hours by caterpillars. It is shovelled backwards and forwards, and moistened with a little newly-slaked lime, a blue froth rises to the surface, and the liquid becomes fitted to impart a green colour, which changes to blue on exposure to the air.

Beckmann has collected some curious illustrations of the opposition which the growers of woad or pastel (another name for the plant) in different parts of Europe made to the introduction of indigo as a blue dye. The ancient Britons are supposed to have employed woad in dyeing their skins; and many evidences exist to show that the same substance was generally employed in many countries of Europe in very early times. The growers of woad prevailed on several governments to prohibit the use of indigo. In Germany, an imperial edict was published in 1654, prohibiting the use of indigo, or 'devil's dye,' and directing great care to be taken to prevent its clandestine importation, "because," says the edict, "the trade in woad is lessened, dyed articles injured, and money carried out of the country." The magistrates of Nuremberg went further, and compelled the dyers of that city to take an oath once a year not to use indigo, which practice was continued down to a late period. In 1538, upon an earnest representation of the States of Languedoc, at the solicitation of the woad-growers, the use of indigo was prohibited in that province; and it was not till 1737 that the dyers of France were left at liberty to dye with such articles, in such a way, as they pleased.

Mr. M'Culloch pointedly remarks, "Let not those who must hammer their own oars over this paragraph smile at the ignorance of our ancestors, mutato nomine, de te fabula narratur. How much opposition is made at this moment to the importation of many important articles, for no better reasons than those were alleged in the sixteenth century against the importation of indigo!" The character now given to woad as a dye is very different from that it had in the sixteenth century, when it was seldom employed without a mixture of indigo. By itself it is incapable of giving a bright and deep blue colour, but the colour which it does give is very durable.

Indigo.—This valuable substance is obtained from a tropical plant called Indigofera, cultivated in the East Indies, and to a much smaller extent in America. The Indian variety (which is that from which our indigo is chiefly produced) has pinnate leaves, and a slight ligeous stem, and, when successfully cultivated, rises to a height of four or five feet. The leaves, as in the case of woad, constitute the part which yields the colouring-matter.

The indigo-plant requires a rich, smooth, and well-tilled soil. The seed, which in figure and colour resembles gunpowder, is sown in little furrows two or three inches deep, at the distance of a foot apart; the sowing season being generally the spring. Moisture causes the plant to shoot above the surface in three or four days, and continual attention is then required to pluck up the weeds, which would otherwise choke the plants. When it begins to flower, it is cut with pruning-knives; and again at the end of every six weeks. It lasts about two years, after which time it degenerates, and is then plucked up and planted afresh. The culture is very precarious, not only in so far as respects the growth of the plant from year to year, but also as regards the quality and quantity of the drug which the same amount of plant will afford even in the same season. Sometimes the plant becomes dry, and is destroyed by an insect frequently found in it; at other times, the leaves, which are the valuable part of the plant, are devoured in the space of twenty-four hours by caterpillars. Hence a saying has arisen, that very frequently "an indigo-plant goes to bed rich, and rises in the morning totally poor." In order that the dyeing ingredient may be extracted from the leaves, the latter are, as soon as gathered, thrown into a large vessel filled with water; care being taken not to lose or scatter a kind of bloom or farina which is found on the leaves, and which constitutes a great part of their value. The leaves ferment during twenty-four hours in the vessel of water, from which the liquid is then drawn off into a second vessel. This liquid is found to be impregnated with a very subtle earth, which alone constitutes the dregs or blue substance that is the object of the process. This earth is combined with a useless salt which the plant had yielded; and it is necessary to separate the two before...
the earth can be recovered in its pure state. The separation is effected by violently agitating the liquid; but if this be not carefully effected, either part of the indigo is wasted, or its quality becomes deteriorated, and it obtains the name of 'burnt indigo.' When it is perceived that the colouring particles collect by raising the rest of the liquor, the whole is left stationary, in order to allow the blue dregs to be precipitated. The water is then drawn off, and the sediment, a kind of thick muddy liquor, is transferred to a third vessel, where it is still further separated from water. It is next strained through cloths, and, when so thoroughly drained as to become a thick paste, it is put into chests, where it is allowed for a period of three months to part gradually with all its moisture.

It then constitutes the indigo of commerce.

Good indigo is known by its lightness, or small specific gravity, indicating the absence of earthy impurities; by the mass not readily parting with its colouring-matter when tested by drawing a streak with it over a white surface; and by the purity of the colour itself. The Bengal indigo is the best kind, and is divided into many qualities according to the purity of its colour; such as fine blue, ordinary blue, fine purple, purple and violet, ordinary purple and violet, dull blue, inferior blue and violet, strong copper, and ordinary copper.

The quantity and value of the indigo used in this country would surprise many readers. There have been exports of eight million pounds a year for those islands, whence they brought large quantities of the plant.

The action of an indigo-dye is very remarkable. In its real state as indigo it is insoluble in water, and only becomes soluble when it is so chemically changed as to produce a yellow dye, and to combine with lime or potash. But any woven fabric which has been thus dyed yellow, begins to turn green immediately on exposure to the atmosphere, and the green gradually changes to the blue for which indigo is so much valued. It appears now to have become almost an indispensable aid to the dyer; and it is said that one pound of indigo leaves will yield thirty times as much colouring-matter as an equal weight of woad, the quality too being superior.

Orchil or Archil.—This dye-drug might perhaps about as fittingly be classed among the reds as the blues; since it is employed for tints in which both of those are combined, such as violet and lilac. The plant itself is a whitish leathen, called by the several names of orchil, archil, Archilla, Archilla, orchelle, archel, archello, archello, and cultivated chiefly in the Canary and Cape de Verd Islands, Barbary, and the Levant. It is a moss which grows upright, partly in single, partly in double stems, which are about two inches in height. When it is old, these stems are crowned with a button, sometimes round and sometimes of a flat form. Those who prepare the moss for the use of the dyer grind it betwixt stones, so as to bruise it thoroughly without reducing it to powder, and then mix it with quicklime and other substances. Alkalies extract from it a colour which is first violet, then purplish red, and then blue.

The use of orchil as a dye has been traced back to very early times. It is supposed to be the same plant as stated by Pliny to grow on the island of Crete, and to have been used for dyeing wool. He states that the colour which it gave, when fresh, was so beautiful, that it excelled the still more ancient purple or violet dye; and that the dyers used it as a ground or first tint for their purple dyes. Orchil is still collected in the Greek islands, where it appears to have been more or less used from the time of the classical writers. Beckmann supposes that the inhabitants of western Europe learned the use of orchil from the Greeks; and that the Florentines introduced it as a dye-stuff into Europe at the beginning of the fourteenth century. He observes that among the oldest and principal Florentine families is that known under the name of the Oricellarii, Rucellarii, or Rucellai; one of whom, in the year 1300, carried on a great trade in the Levant, and, returning with great wealth to Florence, first made known in western Europe the art of dyeing with orchil; and from this useful invention the family received the name of Oricellarii, from which, in process of time, was made from it, which the French call "orseille en pâte." The preparation of this paste was for a long time kept secret by the Florentines; but it gradually spread into other countries. The dyers seldom use this drug by itself, on account of its coarseness and want of durability; but they chiefly employ it to impart a bloom to other colours, by passing the dyed cloth or silk through hot water lightly impregnated with the orchil. The watery solution of orchil applied to cold marble penetrates it, communicating a beautiful violet colour, or a blue bordering on purple, which resists the air much longer than the orchil colours applied to other substances. Dufay says that he has seen marble tinged with this colour preserve it without alteration at the end of two years.

There is a variety of orchil called cudbear, produced from the lichen tartareus, by a process analogous to that employed with orchil. Dr. Thomson has the following remark concerning this substance:—"The manufacture of this dye-stuff was begun about the year 1777, at Leith, by Mr. Mackintosh and Dr. Cuthbert Gordon, from which last the British name of Cudbear (originally Cuthbert) is derived. Leith was found an improper place for the manufacture; but Mr. Mackintosh transferred it to Glasgow, and manufactured cudbear during the rest of his life with success. He left
it to his son Charles Mackintosh, Esq., who still carries it on. The lichens used were at first collected in the Highlands of Scotland; but the rocks of that country being stripped of their covering, the manufacturers had recourse to Sweden and Norway, and likewise to Sardinia, from which prodigious quantities of the lichens were brought. There is said also to be a manufactory of cudbear at Liverpool.”

THE “METEOR” MONKS OF THESSALY.

We must acknowledge a situation like this well chosen by these solitary Carthusians, who, giving themselves little heed for their present wants, allow their thoughts to dwell only on the history of the past, and on their prospects of the future. As the convents lie out of the beaten track, but few travellers are aware of their existence; and they are therefore but seldom visited by strangers. To him, however, who has wandered to their vicinity, their appearance may well occasion some surprise; for, perched on the highest points of insulated rocks, they appear to have been transported thither by angels (like the far-famed House of Our Lady at Loreto), or to have fallen from the clouds like meteors, as it seems almost impossible they could ever otherwise have gained their footing. It is from this latter supposition that they are known among the Albanians as the “Meteors.” There are about nine or ten of these monasteries near Mount Pindus, and the monks who inhabit them, when they leave them to procure provisions or other necessaries, have to be lowered to the ground by a basket and rope, and raised again by the same means, except in one or two instances, where a staircase has been made in the interior of the rock, to the entrance of which (at some height from the ground) access may be gained by ladders furnished by monks in the interior. M. Dupré,

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HORSES IN THE EAST, AND THEIR TREATMENT.

(Concluded from page 448.)

The Arab horses are mostly small, in height seldom exceeding fourteen hands; but few are ill-formed, and they have all certain characteristic beauties which distinguish their breed from any other. The Arabs count five noble breeds, descended, as they believe, from the five favourite mares of Mohammed. But these five principal races diverge into infinite ramifications; for any mare particularly swift and handsome may give origin to a new breed, the descendants of which are called after her. On the birth of a colt of noble breed it is usual to assemble some witnesses, and to write an account of its sire and dam. These genealogical tables never ascend to the grand-dam, because it is presumed that every Arab of the tribe knows by tradition the purity of the whole breed. Nor is it always necessary to have such certificates; for many horses and mares are of such indistinguishable aspect, that the gods might attest the purity of their blood. The pedigree is often put into a small piece of leather covered with a waxed cloth, and hung by a leather thong around the horse's neck.

The Arabs keep their horses in the open air all the year round, not (like the Turkmans) tying them up in the tent, even in the rainy season. Although thus exposed to the inclemency of the weather at all seasons, and with very little attention paid to its health, the Arab horse is seldom ill. From the time that a colt is first mounted (which is after its second year), the saddle is scarcely ever off its back: in winter a sack-cloth is thrown over the saddle, but in summer the horse stands exposed to the mid-day sun. Those Arabs who have saddles ride upon a stuff-ed sheep-skin, and without stirrups: they all ride without bridles, guiding the horse with a halter. In fact, the extreme good temper and entire freedom from vice of a horse which is and which feels itself treated rather as the friend than the slave of man, renders a bridle needless. The Arab is ignorant of the frauds of the European jockey, and, although in their dealings with strangers they are apt to play false as to the pedigree, they may generally be trusted as to the actual qualities of the horse they sell.

Few of them know how to tell the age of a horse by examining its teeth. Burckhardt relates that, when he once looked into the mouth of a mare, it was at first apprehended by the Arabs present that he was practising some secret charm; and when the owner heard that by such inspection the age of the animal might be ascertained, he seemed astonished, and wished that his own age should be told by the examination of his teeth.

The Arabs believe that some horses are predestined to evil accidents; and, like the Osmanlis, they think that the owners of other horses must sooner or later ascend to a new breed, the descendants of which are called ihesun.

TIIE PENNY MAGAZINE.
applied in an endless variety of ways. Sometimes the liquid in the vessel is not only heated, being generated in a boiler in any convenient part of the building, is carried in closed pipes to the apartments to be warmed, which pipes circulate round the

MINOR USES OF STEAM.

When we speak—as we often speak, and with justice—of the gigantic power of steam, we in nearly all cases imply, if we do not mention, the steam-engine as the immediate agent. When a mine is drained, a work necessitated, a locomotive carriage moved, thread spun, cloth woven, pins made, &c., there are other properties in steam which are reared, and ever after treated by their masters.

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one steam-pipe, which passes round the room, and is connected by short pipes with the various vessels. It often happens, however, that the liquid is of such a kind as must be kept free from mixing with the condensed steam; and in such a case a coil of steam-pipe is immersed in the liquid, which is then heated by the metallic surface just as the air of a steam-heated room. This is the method employed with so much advantage in sugar-refineries, where the sugar-pan, in which the crystallization of the sugar goes on, instead of being heated by means of an open fire, must be heated by means of steam, contained either in a cavity below the bottom of the pan, or in a coil of pipe laid in the pan itself. As steam can be produced at various temperatures, according to the heat from which it arises, the pan can be thus heated to any required point, and kept at that temperature—an adjustment which is scarcely possible when the pan is heated over an open fire. Two important advantages often result in manufactures from this circumstance: viz., that thickened liquids, strong solutions, and any porous solid matter impregnated with fluid, may be evaporated and wholly separated from the fluid, without incurring the danger and suffering the deterioration resulting from direct application of the fluid heat. That the liquid should be evaporated, and even boiled, in vessels of wood, which are for some purposes better than those made of metal.

The process of drying by steam is now very extensively adopted in various branches of manufacture; the great advantage being that the temperature can with so much facility be regulated. A steam-klin for drying is as modern in its kind, and is used in the following manner:—The grain is spread out on the iron floor of a large room, which is either perforated with a multitude of small holes, or is formed of a very fine grating. Immediately under the floor steam-pipes of six inches diameter lie parallel to each other at small intervals apart, and radiate heat directly to the grain; large ventilators being provided for the escape of the vapour thus impregnated with moisture.

In the paper manufacture, in starching the yarns preparatory to canvas-weaving, in calico-printing, and numerous branches of manufacture, steam is employed to dry the material, which it does with astonishing efficacy and rapidity. In the modern process of making paper by boiling, the heat of the vessel, both water and steam, will increase in temperature until the expansive force bursts the vessel, the expansive force increasing very rapidly with the increase of heat. If substances be immersed in the water or the steam thus powerfully heated, they may be acted on, especially if of animal origin, in a manner which ordinary boiling could never equal.

The modern "steam-kitchen," or steam-cooking apparatus, exhibits an application of steam by no means unworthy of attention. Here a boiler is so placed as to allow fire conveniently to act upon a vessel of water, and convert the water into steam; while the steam, thus created, is conveyed to various receptacles placed near it. A recess or hot-closet, fitted with shelves, is surrounded by a case, and between them steam circulates, by which the shelves themselves become heated; while steamers and warmers, kettles and saucepans, are brought within reach of the heating agent by pipes branching ad libitum from the boiler.

It would not be difficult to collect numerous other examples in which steam, chiefly by its heating power, is brought into valuable requisition—quite irrespective of that vast power which it exerts as a moving force for machinery.

Tapooca.—Starch is often combined with poisonous substances; and many anxious mothers will be surprised to hear that the mild, bland, demulcent tapioca is obtained from the root of the jatropha manihot, a plant indigenous to the Brezils, Guiana, and the West India Islands, which is one of the most active poisons known, causing death in a few minutes after it has been swallowed. The roots of this plant, which contain a great quantity of sap, are peeled and subjected to pressure in bags made of ruber. The juice thus forced out is so deadly a poison, that it is employed by the Indians as a poison for their arrows. On being allowed to stand, however, it soon deposits a white starch, which, when properly washed, is quite innocent. This starch is then dried in smoke, and afterwards passed through a sifter; and is the substance from which tapioca and the cassava bread of the Indians is prepared. The discovery of the process for separating this powder from the jatropha manihot has been of the greatest importance to the human race, since it enables us to obtain a most valuable article of food from a plant that has been found to possess a poisonous nature, but contains a considerable quantity of nutritious matter; for it is asserted that one acre of manihot will afford nourishment for more persons than six acres of wheat.—Dr. Truman on Food.
The historian arrived at Orthes in the autumn of 1388, and was well received by the count, who, as soon as he saw him, bade him be of good cheer, and, smiling, told him he knew him well, though he had never seen him before— alluding, of course, to his writings. And so he retained him in his household, as Froissart had hoped he would; and for the twelve weeks the latter stayed at Orthes, he had evidently a very pleasant time of it. Not only did he obtain more historical matter than he had even expected, but a world of information besides, illustrative of the acts, feelings, and superstitions of the chivalry he so loved, and which are among not the least interesting part of Froissart's book. Here he is told of the death of Sir Peter Ernaut, a knight of Gaston de Foix's blood and country, who was killed by Gaston because he would not deliver up to him a castle intrusted to him by the English; of the strange malady which seized Sir Peter of Béarn, through a struggle with a bear, who was always getting up in the night to arm himself, and in that state and fast asleep wandering about the house seeking something or somebody to fight; and many other strange and wonderful relations, in some of which Froissart shows that he partook of the general credulity of the age. Whilst he was at Orthes two events also occurred,—the treaty of marriage of the Duke of Berry to Count...
de Foix's cousin and ward, the daughter of the Count of Boulogne, in whose train Froissart departed from Orthes; and the meeting of Count de Foix and his suzerain (for a portion of his lands), Charles VI. of France. But the most valuable passages of this visit are perhaps those relating to the count himself. In Froissart's account of Gaston de Foix we have by far the most complete picture of a wealthy and noble knight of the middle ages that can be found in any ancient writings. It is at once minute and picturesque, equally admirable as the picture of an individual and of a class. Gaston it appears, among his other accomplishments, included a love of literature, to which circumstance Froissart attributes his own honourable reception.

"The acquaintance of him and of me was because I had brought with me a book, which I made at loved hunting;" but we must add that the count's love of contemplation of Wenceslaus of Bohemia, Duke of Luxembourg and of Brabant, which book was called Orthes; and the meeting of Count de Foix and his varlets, standing before his table all supper: they would have sung it right well himself: he would have sent it to the other tables bravely: all this I would gladly see conceits and fantasies at his table; and when he had seen it, then he would send it to the other tables bravely: all this I considered and advised." Froissart says, briefly, "he was hunting;" but we must add that the count's love was positively a passion. One author says he had no fewer than sixteen hundred dogs; and we know that he was the author of a book on hunting which went through several editions in the early days of the press.

It was on his return from a bear-chase in 1391 that he died of apoplexy, whilst his attendants were pouring wine into his chamber to supper, he had ever before him twelve torches burning, borne by twenty varlets, standing before his table all supper: they gave a great light, and the hall [was] ever full of knights and squires, and many other tables [were] dressed to sup who would. There was none should speak to him at his table, but if he were called. His meat was lightly, with fowl, the legs and wings only; and in the day he did but little eat and drink. He had great pleasure in harmony of instruments; he could do it right well himself: he would have songs sung before him. He would gladly see conceits and fantasies at his table; and when he had seen it, then he would send it to the other tables bravely: all this I considered and advised." Froissart says, briefly, "he was hunting;" but we must add that the count's love was positively a passion. One author says he had no fewer than sixteen hundred dogs; and we know that he was the author of a book on hunting which went through several editions in the early days of the press.

Among the remarkable stories which Froissart was told at the castle of Orthes during this memorable visit was one of a highly imaginative character, which illustrates a noticeable trait of the time, its superstitious credulity. The Count of Foix was a politic prince as well as a brave and accomplished knight, and admirable in perception. He was perceiving much abroad him, and in the midst of difficulties. His neighbours on all sides—France, Spain, the Low Countries, all were in a continual state of warfare, either in their own respective dominions, or with each other, or with England; and it required quite as much intellectual as physical power to remain safe amidst all their marches and counter-marches, their treaties and their alliances, their quarrels and their wars. He was he who was the most skilled in receiving constantly from all parts, by paid messengers, intelligence of whatever was stirring in the political world, and the excellence of his arrangements in this matter produced such marvellous results to those who were ignorant of the means, that magic as usual was called in to explain the mystery: and we learn from Froissart's relation that he had a book of incantations and spells, which he desired his chaplain to recite every night (night-prayer) of the Psalter, matins of our Lady, of the Holy Ghost, and of the cross, and dirge every day. He took in his country to receive his revenues, and to serve him notable persons; that is to say, twelve receivers, and ever from two months to two months two of them should serve for his receipt; for at the two months' end he would change and put other two into that office, and one that he trusted best should be his comptroller, and to him all other should account, and the comptroller should account to him by rolls and books, with the accounts to remain in the chapel at Orthes, and in the earl. He had certain coffers in his chamber, out of which oftentimes he would take money to give to lords, knights, and squires, such as come to him; for none should depart from him without some gift; and yet daily multiplied his treasure to resist the adventures and fortunes that he doubted. He was of good and easy acquaintance with every man, and amorous would speak to them. He was short in counsels and answers. He had four secretaries, and at his rising they must ever be ready at his hand without any calling; and when any letter were delivered him, and that he had read it, then would he call them to write again, or else for some other thing. In this estate the Earl of Foix lived. And at midnight, when he came out of his chamber into the hall to supper, he had ever before him twelve torches burning, borne by twenty varlets, standing before his table all supper: they gave a great light, and the hall [was] ever full of knights and squires, and many other tables [were] dressed to sup who would. There was none should speak to him at his table, but if he were called. His meat was lightly, with fowl, the legs and wings only; and in the day he did but little eat and drink. He had great pleasure in harmony of instruments; he could do it right well himself: he would have songs sung before him. He would gladly see conceits and fantasies at his table; and when he had seen it, then he would send it to the other tables bravely: all this I considered and advised." Froissart says, briefly, "he was hunting;" but we must add that the count's love was positively a passion. One author says he had no fewer than sixteen hundred dogs; and we know that he was the author of a book on hunting which went through several editions in the early days of the press.
he has made restitution. The knight speaks kindly to the spirit, and prays him to leave the clerk, and come and serve him; and the spirit, "a love with the knight," agrees; and thenceforth the lord of Corasse knows of that, and was done in any part of the world," and as he was accustomed to impart to the Count of Fox what ever news Orthon had brought him, the count soon perceived that no ordinary agencies were at work; and, on examining his informant "straightly," was told the truth. Gaston's curiosity being roused, he asked the lord of Corasse if he had ever seen his messenger, "Nay, surely," quoth the knight, "nor I never desired it." The count, however, induced him to promise to make an attempt to see what "form and fashion" it was of. "And so on a night, as he lay in his bed with the lady his wife, who was so inured to hear Orthon that she was no more afraid of him, then came Orthon and pulled the lord by the ear, who was fast asleep, and therewith he awoke, and asked who was there?" "I am here," quoth Orthon. Then he demanded, "From whence comest thou now?" "I come," quoth Orthon, "from Prague, in Bohemia.

How far is that hence?" quoth the knight.

A threescore days' journey.

And art thou come thence so soon?"

"Yea, truly," quoth Orthon, "I come as fast as the wind, or faster.

Hast thou then wings?" quoth the knight.

"Nay, truly.

How canst thou then fly so fast?"

"Ye have nothing to do to know that," quoth Orthon.

"No," quoth the knight; "I would gladly see thee, to know what form thou art of."

"Well," quoth Orthon, "ye have nothing to do to know it; it is sufficient you to hear me, and I to show you tidings."

In faith, quoth the knight, "I would love thee much better an I might see thee once."

"Well, sir," quoth Orthon, "since ye have so great desire to see me, the first thing that ye see tomorrow when ye arise out of your bed, the same shall I."

"In the morning the knight arose, and easily out of his bed, and sat down on his bed-side, weening to have seen Orthon in his own proper form; but he saw nothing whereby he might say,—Lo! yonder is Orthon!" So that day passed and the next night came; and when the knight was in his bed, Orthon came and began to speak, as it was accustomed. "Thou thy way," quoth the knight, "thou art but a liar. Thou art mistaken that I should have seen thee, and it was not so."

"No?" quoth he; "and I showed myself to thee."

"That is not so," quoth the lord.

"Why," quoth Orthon, "when you rose out of your bed, saw you nothing?" Then the lord studied a little, and advised himself well. "Yea, truly," quoth the knight; "now I remember me, as I sat on my bed's side, thinking on thee, I saw two straws on the pavement, tumbling one upon the other."

"That same was I," quoth Orthon, "into that form did I put myself as then.

"That is not enough to me," quoth the lord: "I pray thee put thyself into some other form, that I may better know thee."

"Well," quoth Orthon, "ye will do so much that ye will love me, and I go from you, for you desire too much of me."""Nay," quoth the knight, "thou shalt not go from me; let me see thee once, and I will desire no more."

"Well," quoth Orthon, "ye shall see me to-morrow; take heed, the first thing that ye see after ye be out of your chamber, it shall be I."

"Well, quoth the knight, I am then content; go thy way, let me sleep. And so Orthon departed and the next morning the lord arose, and issued out of his chamber, and went to a window and looked down into the court of the castle, and cast about his mind. And the first thing he saw was a sow, the greatest that ever he saw; and she seemed to be so lean and evil-favoured that there was nothing on her but the skin and the bones, with long ears, and a long lean snout. The lord of Corasse had marvell of that lean sow, and was weary of the sight of her, and commanded his men to fetch his hounds, and said, 'Let the the sow hunt her to death.' But the sow, in a moment, opened the kennels and let out his hounds, and did set them on this sow. And at the last the sow made a great cry, and looked up to the lord of Corasse as he looked out at a window, and so suddenly vanished away, no man wist how. Then the lord of Corasse entered into his chamber right pensive, and then he remembered him of Orthon his messenger, and said, "I repent me that I set my hounds on him; it is an adventure an I ever hear any more of him; for he said to me oftentimes that if I displeased him I should lose him.' The lord said truth, for never after he came into the castle of Corasse; and also the knight died the same year next following."

The Earl of Foix served with such a messenger? asks Froissart at the conclusion of the tale. "Surely," quoth the squire, "it is the imagination of many."

On Pruning Trees.—Mr. Thomas Baylis, who is well acquainted with the nature of trees, and by whom my attention was first directed to the baneful effects of pruning, planted a belt of about five hundred pear-trees, at Ledbury, in the county of Hereford. Sixty of these trees were left unpruned, with the others pruned, with naked stems, as trees generally are in nurseries. The sixty unpruned trees had no advantage in soil or situation; yet on an average their growth in a few years was at least three times greater than that of the pruned trees. The unpruned trees were much better formed for transplantation or orcharding than the pruned ones; their stems were furnished with strong thorny branches: these branches, in addition to the other good offices they had performed and were performing to enable the tree to outgrow the pruned ones so far, made excellent natural fences for each other, and for the tree itself; and served sufficiently to prevent the sparrows from their injury, and to prevent the bird which had caught them being disturbed. The sparrows thus relieved from their injury was in the attempt to point out the error that has fallen into by the cultivators of timber-trees. The apple and pear trees in this county are generally rendered fruitless at an early age through ill treatment. The apple-tree in particular dies overpowered by the numerous injuries inflicted on it by its misjudging and officious cultivators. At a time of life when it should be in its greatest prosperity, it is falling to pieces with premature old age; its limbs are, one after the other, blown from its rotten trunk; and it may truly be said that the apple-tree seldom dies a natural death, its death being generally occasioned by an accumulation of injuries. Whenever a tree has a live sprout cut from it, it is injured in a manner that never can be entirely repaired. Every wound received is stored up; and if wounds be continually added, they will accumulate to a degree too great to be borne, and the tree will sink under its infirmities."

Treatise on the Nature of Trees, &c., by Stephen Ballord.—[We give this extract as stating a fact, in exemplification of a theory supported by the author as to the prejudicial effects of pruning, without at all adopting that theory. The subject is certainly interesting, for there is no doubt that pruned apple and pear trees are constantly subject to early disease and premature decay, while the unpruned crab remains healthy and vigorous. It is probably true that trees cannot always be more applicable to certain kinds of trees and to certain situations than others, and will require much observation and recorded experience to reduce it to a system. The view here taken, though not common, is by no means singular, but is supported by some good authorities. The subject certainly deserves attention.
COLOGNE CATHEDRAL.

[Continued from page 445.]

The cathedral is itself so magnificent and on so large a scale, being four hundred feet long and one hundred and sixty-one broad, that, when contemplating its grandeur as a work of art, we almost forget the shrines and relics which it contains, though some of the former are curious and interesting. The shrine of the Three Kings of Cologne is in a small marble chapel, in the Ionic style, behind the high altar. These kings, as tradition reports, were the Magi who came from the East to bring presents to the infant Saviour. The emperor Frederic Barbarossa brought their bones from Milan after taking that city by storm in 1170. They are placed in a case of solid silver. The skulls, which are the only parts that remain, were once crowned with golden diadems enriched with jewels. Each skull is inscribed with a name written in rubies, —Gaspar, Melchior, and Balthazar. The shrine of the "Three Kings of Cologne" was once the most famous in Christendom, and was profusely adorned with precious stones. In 1794 these relics were carried off by the chapter to Arenberg, in Westphalia, to prevent their seizure by the French. They were brought back in 1804, but in the mean time some of the precious stones were taken away: imitations in paste or glass have been substituted, and the crowns of the Three Kings are now of silver gilt. There still remains a display of stones, gems, cameos, and enamel-work sufficient to show the former richness of the shrine.

Amongst the other objects of interest in the cathedral are the silver coffin of St. Engelbert and some fine monuments, several splendid painted windows, a beautiful altar-table, rich candelabra, curious tapestry, and a singular painting, with the date of 1410, representing the Patron Saints of Cologne. The sacristans profess to show one of the bones of St. Matthew. But to return to the edifice itself.

Vogt, an accurate writer on Rhenish history, gives the following account of the original design:—"It was (he says) designed to form a Latin cross, the length of which, from east to west, should be four hundred feet, and the width two hundred feet. Over the intersection of the arms of this cross it was contemplated to erect a cupola of the largest possible size. At the western extremity there were to have been two enormous towers, each of five stories high; the several stories to be supported upon curious pillars, and the towers to be surmounted with pointed spires of finely carved fret-work. The lower story of each
hall was designed to form an ante-hall or porch to the two main entrances of the church. At the lateral extremities of the cross, in the northern and southern sides of the building, there were to be also two grand entrances. Four hundred and sixty ponderous pillars, ranged in double rows from east to west, were destined to support the immense roof; and an equal number of pillars, to correspond with these, were to be inserted in the side-walls of this transcendent edifice. Each pillar was to be of a different design from its fellow, and no one of the pilasters was to be of the same form as the other." The projector of the noble structure was Engelbert the Holy. He was Archbishop of Cologne, and Count of Berg in his own right, in 1220.

The edifice was commenced in 1248. It is singular that the name of the architect is altogether unknown, and fanciful legends have been related to account for this unusual circumstance: they may be seen in Mr. Snowe's 'Legends of the Rhine.'

Merian, the old local historian of Cologne and its sister Roman colonies, mentions the plan adopted for the completion of the building:—"It was made a condition that every one of the builders should add a portion of the original design to that which had already been erected before him; to the end that, in the course of years, the whole edifice might be completed: and this good custom was long complied with. But in the end it fell into disuse, owing to the local troubles which first broke out between the archbishops and the citizens, and then to the troubles which affected Germany generally up to the period of the Reformation. Thus this noble monument of religion and of art still remains in an unfinished condition." Schreiber, describing its recent state, says,—"The two towers, which were intended to be five hundred feet high, remain unfinished: the northern one is not more than twenty-one feet above the ground, and the other is little more than half the intended height. Only the German— that is to say, all that is base, false, and inhuman—of the Germans, has completed its part in this noble edifice. The choir of the church and the chapels surrounding it are all in a state of ruin, baffling the desires of those who wished to see the last stone finished of so grand a monument of man's intellect and industry. For many years the late King of Prussia advanced large sums towards the repair and maintenance of the choir. To his son, the present king, has devolved the more gratifying duty of commencing in earnest the completion of the entire design. The first stone of the new works for finishing the structure was laid by him with much ceremony on the 4th of September, 1842. All Germany has taken interest equally heightened in this great object. The King of Prussia has pledged himself to raise in a large annual sum for this purpose; other princes have followed his example; and private subscriptions have been raised to aid the undertaking, not only in Germany, but in other parts of the Continent. The architect, M. Zwirner, calculates that a sum equal to 720,000£ will be required, and that the work will occupy about thirty years. Let us hope that no new outburst either of civil faction or foreign hostility will once more cause the builders to suspend their labours.

"At the moment when the King of Prussia took the mallet in his hand, the ancient crane on the top of the south tower was once again seen in motion, slowly raising a ponderous stone, while a thousand acclamations hailed what was destined to be an interesting event.

His majesty's speech on the occasion, omitting a brief introduction, was as follows:—"Gentlemen of Cologne, a great event is about to take place among you. Your feelings will tell you that it is no common edifice you are about to erect. It is the offspring of the spirit of union and concord among Germans of every creed. When I reflect on this, my eyes are filled with joyful tears; and I thank God that I have lived to witness this day. Here, where this foundation-stone is laid, rearing their heads with towering venders, will arise the noblest portals in the whole world. Germany builds them: may they, by the grace of God, be to her the entrance gates to a new, a great, and a happy future! Far from them be all that is anti-German; far from them be all that is base, false, and inhuman. May this portal of honour never be disgraced by bad faith, or by the unworthy disunion of German princes or of the German people. May the spirit which would disturb the peace of creeds, or impede the progress of social order—that spirit which once interrupted the building of this house of God, and in many, but in other parts of the Continent. The archictects of Cologne, your city has by this structure obtained a high pre-eminence over all the other towns of Germany; she has this day proved herself worthy of that pre-eminence. Join then with me as I strike the trowel on the foundation-stone: shout with me your rallying-cry of ten centuries—'Almab Colgone!'"
T I M E.
[Abridged from the 'Penny Cyclopædia.]

This word may be considered either with reference to our abstract idea of the thing signified by it, or to the measures of it which have been contrived for use in the business of life.

When we think of time in the usual manner, it is of a thing external to ourselves which we cannot help imagining to have an existence and a measure, both of which would remain, though those who now speculate upon the conception were annihilated. A little more consideration shows that we are indebted for the idea to successions of observed events, or at least for the power of applying the idea to external objects. No description can be adequate; if we say that change necessarily implies time, and that the perception of that which is, being different from that which was, suggests the notion of an interval, we see that we have already fully assumed the idea of time in the words is and was. But we may say that space and the objects which fill it exist independently of ourselves, and would undergo changes though we were not in existence to perceive them, and that therefore the times which those changes require would also exist; this involves the whole of the most abstruse part of metaphysics, and is much beyond the scope of our article. We shall therefore turn to the mode of measuring time; we have a thorough conception that time is a magnitude, that is, has its more and less. We must less consider what we mean by a greater or a smaller time.

In the perception of time as a magnitude, that is, of intervals of time as containing more or less of duration, we refer in the first instance to a habit derived from continual acquaintance with those great natural successions on which the usual actions of our lives depend, with which we can constantly, though unconsciously, compare the duration of our thoughts and actions. There is no more an absolutely long or short time than there is an absolutely great or little space; these words are only comparative. If, for example, any one were to affirm that the universe was continually growing less and less, all its parts altering in the same proportion, and the dimensions of the habitable race would decrease, it is quite possible that the whole solar system would now go into a nutshell, such as nut-shells were a thousand years ago, it would be impossible either for him to prove it, if true, or for any one else to prove the contradiction, if false. In like manner, if any one were to say that the revolutions of all the heavenly bodies were continually accelerating, but that the properties of matter were also continually altering, and the speed with which ideas are formed and communicated, and muscular efforts made, continually increasing, it would be impossible to prove a contradiction. The oriental story is the best illustration of this:—A prince was ridiculing the legend of Mohammed being taken up by an angel, and holding many long conferences with his Creator, and having much to do with heaven and hell to the smallest details, in so short a time, speaking with reference to things upon earth, that, on his being brought back, the water had not quite flowed out of a jug which he had dropped from his hand when the angel caught him. A magician at the court of this prince checked his laughter by offering to prove the possibility of the story, if his highness would only dip his head into a basin of water. The prince consented, and, the instant his head was immersed, found himself lying by the sea-shore in a strange country. After a reasonable quantity of maladjustment upon the magician, he found himself obliged by hunger to go to a neighbouring town, and seek the means of support. In time he became independent, married, and brought up a family, but was gradually stripped of all his substance by losses, and buried his wife and children. One day he threw himself into the sea to bathe, and on lifting his head out of the water, found that he had only lifted it out of the basin, the magician and the other courtiers standing round. On his bitterly reproaching the magician, the latter assured him, and was confirmed by all the bystanders, that he had done nothing but just dip his head into the basin and lift it out again. Of course the prince expressed no more doubts about the story of Mohammed; and however much any reader of the two tales may think that neither is true, a little reflection will show that either might be so. Perhaps the allegory might have been suggested by what is known to take place in dreams; there is evidence enough that many of the longest of these illusions really occupy no more time than, if so much as, a second or two by the pendulum.

The actual measure of time depends upon the feeling of being able to secure successions of similar events which shall furnish epochs separated by equal intervals of time. We cannot do this by our thoughts, except approximately, and for short periods. The memory of a musician aided by the sentiment or feeling of time, which is part of a good ear for music, will do remarkably well for a short period: a person who could not well preserve the division of a second into eight parts at least would make a poor figure in an orchestra. As to the judgment of considerable periods of time, it is materially influenced by the manner in which it has been spent: a time which has passed quickly, another of a contrary habit the contrary; and this whether the rapidity is a consequence of quickness of ideas, or of having little to recall.

In all the more correct machines which have been invented to measure time, there is but one principle: a vibration is kept up by the constant application of the controlled force of a coiled spring or pendulum; but that the properties of matter were also continually altering, and the speed with which ideas are formed and communicated, and muscular efforts made, continually increasing, it would be impossible to prove a contradiction. The oriental story is the best illustration of this:—A prince was ridiculing the legend of Mohammed being taken up by an angel, and holding many long conferences with his Creator, and having much to do with heaven and hell to the smallest details, in so short a time, speaking with reference to things upon earth, that, on his being brought back, the water had not quite flowed out of a jug which he had dropped from his hand when the angel caught him. A magician at the court of this prince checked his laughter by offering to prove the possibility of the story, if his highness would only dip his head into a basin of water. The prince consented, and, the instant his head was immersed, found himself lying by the sea-shore in a strange country. After a reasonable quantity of maladjustment upon the magician, he found himself obliged by hunger to go to a neighbouring town, and seek the means of support. In time he became independent,
divided, as are all other days, into twenty-four hours of sixty minutes each, &c. The time so given is called sidereal time. If the sun were a fixed star, this sidereal time would be the common mode of reckoning.

But the sun having its own slow motion in the ecliptic, in the same direction as the revolution of the earth, the interval between one meridian transit of that body and the next is longer than the simple revolution of the earth, for just the same reason that the time which the minute-hand of a watch moves from coincidence with the hour-hand to coincidence again is longer than the hour, while the movement of the minute-hand of the sun moved uniformly, and in the equator, the real solar day, which means the interval between two meridian transits of the sun, would always be of the same length, and a little longer than the sidereal day. But the sun neither does move uniformly nor in the equator; and each of these circumstances causes a slight irregularity in the absolute length of the solar day, or, as it is called, the real solar day. This is the reason why the time shown by a sundial does not agree with the watch.

To remedy this inconvenience, a fictitious sun is supposed to move in the ecliptic, and uniformly, while another fictitious sun moves in the equator, also uniformly. Both the fictitious bodies have the average movement, so that they are the same; and the fictitious sun of the ecliptic is made to coincide with the real sun at the perigee and apogee, or nearest and farthest points from the earth; while the fictitious body in the equator is made to coincide with the fictitious body of the ecliptic at the equinoxes (from which it arises that there is also a coincidence at the solstices). This fictitious sun of the equator, that to which clocks are adjusted, would be no equation of time at the equinoxes and solstices, because the interval between two of its transits, which is always of the same length, is called a mean solar day, which is divided into twenty-four mean solar hours, &c. The difference between time as shown by the real sun and the fictitious sun in the equator is called the equation of time.

The determination of the equation of time is a mathematical problem of some complexity: what we have here to notice is, that, owing to the joint action of the two sources of difference, it presents a very irregular series of phenomena in the course of the year. If the sun moved regularly, but in the ecliptic, there would be no equation of time at the equinoxes and solstices; and that to which clocks are adjusted, the interval between two of its transits, which is always of the same length, is called a mean solar day, which is divided into twenty-four mean solar hours, &c. The difference between time as shown by the real sun and the fictitious sun in the equator is called the equation of time.

The minor comforts of cleanliness are of course foregone to avoid the immediate and greater discomforts of having to fetch the water. In general it has appeared in the course of the present inquiry that the state of the conveniences gives, at the same time, a very fair indication of the state of the habits of the population in respect to household and personal cleanliness. The Rev. Whitwell Elwin, the chaplain of the Bath union, gives the following illustration of the condition even in that city, which is well supplied with water:— "A man had to fetch water from one of the public pumps in Bath, the distance from his house being about a quarter of a mile. It is valuable," he said, "as strong beer. We can't use it for cooking, or anything of that sort, but only for drinking and tea. Where do you get water for cooking and washing?"—"Why, from the river. But it is muddy, and often stinks bad, because all the filth is carried there." Do you then prefer to cook your victuals in water which is muddy and stinks, to walking a quarter of a
mile to fetch it from the pump?—'We can't help ourselves, you know. We could not go all that way for it.' There are many gentlemen's houses in the same district in which the water is not fit for cooking; and I know the extraordinary inconvenience and inconvenience undergone to avoid the expense of water-carryage. I have often wondered to see the shifts which have been endured rather than be at the cost of an extra pail of water, of which the price was three halfpence. With the poor, far less obstacles are an absolute barrier, because no privation is felt by them so little as that of cleanliness. The propensity to dirt is so strong, the steps so few and easy, that nothing but the most natural facilities for water can act as a counterpoise; and such is the love of cleanliness, when once contracted, that no habit, not even drunkenness, is so difficult to eradicate.

In most towns, and certainly in the larger manufacturing towns, those members of a family who are of strength to fetch water are usually of strength to be employed in profitable industry, and the mere value of their time expended in the labour of fetching water is almost always much higher than the cost of regular supplies of water even at the charge made by the water companies. In Glasgow the charge for supplying a labourer's tenement is 5s. per annum; in Manchester 6s.

In London the usual charge is 10s. for a tenement containing two families, for which sum two tuns and a half of water a week may be obtained if needed. For 5s. per annum, then, as a water-rate (on which from 10 to 20 per cent. is paid to [by] the owner for collection), each labourer's family may be supplied in the metropolis with one tun and a quarter of water weekly, if they find it necessary to use so much. The tun is 216 gallons, equal to 108 pailfuls, at two gallons the pail. Thus for less than one penny farthing, 135 pailfuls of water are taken into the house without the labour of fetching, without spilling or disturbance, and placed in constant readiness for use. Under any circumstances, if the labourer or his wife or child would otherwise be employed, even in the lowest-paid labour or in knitting stockings, the cost of fetching, without spillage or disturbance, and placed in constant readiness for use.

In illustration of the difference in economy of the two modes of conveyance, I may mention that the usual cost of filtered water carried into the houses at Paris by the water-carriers is two sous the pailful, being at the rate of 8s. per tun; whilst the highest charge of any of the companies in London for sending the same quantity of water to any place within the range of their pipes, and delivering it at an average level of 100 feet, at the highest charge, is 6d. per tun.

At the highest of the water companies charges it would be good economy for the health of the labourer's family to pay for water being laid on in the house, to reduce the expense of medicines and loss of time to the family, as indicated by any of the tables of sickness. The cost of laying on the water in a labourer's tenement, and providing a butt or receptacle to hold it, may be stated to be on an average 40s., which will last twenty years.

The Markets in St. Petersburg.—Not only is everything brought in slogens to market, but the slogens serve at the same time for shops and counters. The mats which cover the goods and dollars lack a little, and the pieces of grease, fowls, and calves are raked on the edge, and hung up at the corners and on the tops of the posts. The grease are cut up into a hundred pieces; the necks are sold separately, the legs separately, the heads and rumps separately, each in dozens and half-dozens strong. To be poor is to think of the rump, buys a string of frozen heads, and he who finds the heads too dear gives six epecks for a lot of necks, while he who cannot afford these makes shift with a couple of dozen feet, which he brings down on Sunday into a soup for his family. The slogens with oxen, calves, and goats have the same appearance. These animals are brought to market perfectly frozen. Of course they are suffered to freeze in an extended posture, because in this state they are most manageable. There stand the tall figures of the oxen, like black-stained ghosts, lifting up their long horns, around the sides of the slogen; while the goats, looking exactly as if they were alive, only with faint, glazed, and frozen eyes, stand threateningly opposite to one another. Every part is hard as stone. The carcasses are cut up, like trunks of trees, with axe and saw. The Russian is particularly fond of the sucking pig, and whole trains of slogens laden with infant swine come to the market. The little starvelings, strung together like thistles, are sold by the dozen, and the long-legged mothers keep watch over them around the slogen. The amount of the Russian butcher is a matter of course. For, as every part, flesh or bone, is alike hard, they have no occasion to pay regard to the natural divisions of the joints. With the saw they cut up hogs into a number of steaks, an inch or two inches thick, as we do a rump of beef. The flesh splits and splits during the operation, and so the dish is always in pieces, and they are put into the scales with shovels. The large pike, salmon, and sturgeon, every inch of which was once so little and supple, are now stiffened as if by magic. To protect them from the warmth, in case of sudden thaw— for thawing would essentially impair— their flanks are wrapped in mantles, and the wenchses are very busy picking up the animal splinters out of the snow. You do not ask for a steak, a chop, a joint, but for a slice, a block, a lump, a splinter of meat. The same is the case with fish; they too are as cut out of marble and wood. Those are the diminutives species, like the snakki, are brought in sacks, and they are rung up and they are rung down on Sunday into a soup for his family. The sledges down on Sunday into a soup for his family. The sledges are rauredon the edge, and hung up at the corners and on the tops of the posts.
A DAY AT A ROPE AND SAIL-CLOTH FACTORY.

Our "visit" on the present occasion takes us to the East end of the metropolis, where shipping and the emblems of shipping meet the eye on every side; where the shops exhibit those multifarious commodities necessary for the fitting-up of a ship, or the fitting-out of the "jolly tars," whose castle the ship is to be; where the bustle in the streets is chiefly the bustle connected with seafaring people; and where the very atmosphere seems to tell a similar tale.

The history of a rope is a more curious one than many readers or observers would suppose. This invaluable part of a ship's fittings is associated in the minds of some with the idea of a clumsy, dirty, tarry bundle of fibres, roughly twisted together, and coated with something altogether repugnant to the delicate fingers of the West. But we may perhaps be able to show that a large measure of inventive ingenuity has been displayed in the arrangements connected with the construction of a rope, and that—as in many an analogous case—a rough exterior envelops much to merit our attention.

The firm of Sir Joseph Huddart and Co. have liberally permitted us to describe the operations of their manufactory at Limehouse; an establishment presenting unusual points of interest to a visitor, from the circumstance that the manufacture of ropes and of sail-cloth is here carried on in conjunction. In our notice of Messrs. Green and Wigram's ship-yard, in the volume for 1841, we had occasion to speak of a rigging-house and of a sail-loft; in the former of which the cordage, obtained from the rope-maker, is adapted to the wants of a ship; while in the latter, the canvas, obtained from the weaver, is worked up into the form of sails. To the manufacture of these two commodities, as combined by one firm, the following details relate. But first let us take a bird's-eye view of the buildings and fields and avenues constituting the factory.

Those who are not acquainted with Limehouse beyond the fact that it is situated somewhere in the remote east, may be informed that it is contiguous to the Thames at the north-west extremity of the Isle of Dogs; and even of those who do know the spot, some may perhaps be ignorant that there is a canal extending from the Thames at Limehouse to the River Lea. On the north bank of this canal is situated the factory which the reader is about to visit. The canal was cut some seventy years ago at the expense of the city of London, to form a short communication between the upper course of the river Lea and the Thames at London, by avoiding the tortuous windings of Bow Creek, and of the Thames round the Isle of Dogs. We believe it has not been a very profitable speculation; but with this we have nothing here to do. At the end of a lane a few hundred feet northward of Limehouse Church, and near this canal, we enter, through a pair of folding gates, the premises of the factory.

The first object to be seen is an open plot of ground, bounded on one side by the muddy waters of this almost-deserted canal, and on the other by buildings. A second pair of entrance-gates affords access to the buildings, which consist of three parallel ranges, separated by open courts. The left of these ranges is a long, low, open tile-roofed building, used principally as a rigging-house. In the central and right-hand ranges are the various apartments in which the manu-

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facture is carried on, and which are very numerous. Those nearest the entrance are offices and warehouses of different kinds. In one long apartment, full of little floating hempen particles, the hatchelling, or preparation of the hemp, is being carried on. In another the boiler and other apparatus connected with the tarring of the hempen yarn. In a separate building the barrels of tar are deposited, as a precautionary measure in case of fire. In one room are two beautiful machines, hereafter to be described, for making the earlier forms of a rope without the aid of a rope-walk. In another, iron-floored and fire-proof, is an elaborate machine for making flat-ropes.

But the most novel part of a rope-factory, to a stranger, is the apparently interminable walk or avenue in which ropes are customarily made. These walks far exceed in length the workshops of most other classes of artisans; they are from six to twelve hundred feet in length, and are generally covered with a tiled roof, whether or not they are closed at the sides. At the factory under consideration there are two of these avenues, forming the northern continuations of two of the ranges of buildings. In one of them, boarded on one side and open on the other, the early process of rope-making is carried on, viz. that in which the hempen fibres are spun into yarns. In the other the ropes are formed from the smallest elements present in the flaxen yarns, the so-called lining-walk; this walk, like the other, has an earthen floor, but it is enclosed on both sides, and has above it another long room where the yarns are prepared for twisting. Here too in the 'laying-walk,' as it is termed (laying being the technical term for what we should call the making or twisting of a rope), we may see a little railroad, on which a travelling engine is in constant motion, raising, lowering, and even reversing the air of the room.

Besides all these buildings, which relate to the rope-manufacture only, there are those connected with the sail-cloth manufacture. First there is a building detached from all others, and provided with boilers, copper, presses, and other apparatus, where the flaxen yarns are washed and prepared for the weaver. There, in a large spacious hall, between the sides of the building and the canal, in which the flax-yarns are hung up on poles to dry and bleach; and near this an artificial mound containing a reservoir of water for the use of the whole establishment. Then within doors is a large and busily occupied apartment, filled with machines for winding and preparing the yarns for the weavers. To this succeeds another wherein forty power-looms produce such a deluge of threads that sometimes taxes the ear of one who is unused to such scenes of bustle. In a long avenue we see thirty or forty hand-loom weavers plying the shuttle in the mode which is now so often superseded by machinery, but which is still conveniently adopted under some circumstances. In another room is a calendering-machine, to give the finishing touch to the woven material.

It will thus be seen that the two departments of the establishment occupy a very wide area of ground, and a numerous series of buildings. Let us next endeavour to understand the nature of the processes going on; and first for the

ROPE MANUFACTURE.

The material for nearly all our cordage comes from Russia. Some is imported from Manilla, and a small quantity, we believe, from other places; but the great bulk is received from St. Petersbourg and the neighbouring parts of the Russian dominions. The quantity which reaches England from that country is immense. In the eight years from 1825 to 1832, there was, on an average, considered more than 2.5 million pounds imported annually; a poind being a Russian weight, of which sixty-three make a ton; or, more familiarly, a poord is about thirty-six pounds English. The value of the hemp imported for our manufactures in 1839 amounted to more than six hundred thousand pounds.

The hemp arrives in England in large bundles, which are separated at the rope-ery into smaller portions; or rather, this separation is effected in the hold of the vessels, where the bundles, weighing nearly a ton each, are separated into heads or' layers,' each containing about twelve or fourteen pounds of hemp. The qualities required in good hemp are, that the fibres should be long, fine, and thin, smooth and glossy on the surface, free from fragments of the woody fibre of the hemp-plant, and possessed of considerable strength and toughness.

Before the rope-maker can begin to use the hempen fibres, it is necessary that they should, be straight and parallel, free from dirt, and reduced as nearly as may be to an equable thickness. To effect these preparations the hemp is passed through a number of processes which is termed 'heckling,' or 'hatchelling,' or rather, this separation is effected in the hold of the vessel, where the bundles, weighing nearly a ton each, are separated into heads or layers, each containing about twelve or fourteen pounds of hemp. The qualities required in good hemp are, that the fibres should be long, fine, and thin, smooth and glossy on the surface, free from fragments of the woody fibre of the hemp-plant, and possessed of considerable strength and toughness.

The hemp fibres are not only straightened by this mode of proceeding, but the thicker ones are split by the sharp points of the wires, and all the loose fragments are made to separate and fall to the ground. Sometimes the hemp is moistened with a little water in which a hay-band is formed from small blades of hay, will illustrate the strength which this kind of entanglement imparts. But this is not all; the entanglement produced by twisting the fibres not only enables the rope-maker to produce cordage of any desired length, but also, by making the rope hard and compact, increases the utility and enables it in a great measure to resist the penetration of water.

The fibres, then, are twisted round one another to
form a rope; but here a curious circumstance presents itself for notice. We never see a bundle of fibres simply formed into one twist; for a rope appears to present some twists in a left-handed direction, and others in a right; and also it appears to be made up of smaller ropes. Let us analyse a 'rope's end,' and see how it is built up. We have here a representation of a small piece of cablet (a nautical name for rope formed in the same manner as, although much smaller than, a cable), which is so dissected at one end as to show the component parts. In the first place we have the cablet itself, presenting the appearance with which most persons are familiar who have ever been on board a ship. By applying a little force to this, we can untwist it, and it then presents to view three smaller ropes, such as b, the powerful aggregation of which had formed the cablet. Each of these is known technically as a 'hawser-laid' or 'shroud-laid' rope, meaning thereby a rope formed in the same manner as a hawser or a shroud rope. Selecting one of these three, and applying a force to untwist it, we find that it is formed of three smaller ropes, such as c, which are called in the roperies 'strands;' so that there are nine of these strands in the cablet. Pursuing our analysis still further, by untwisting one of the strands, we find that it is composed of a considerable number of small strings, such as d, all about equal in thickness; these are called 'yarns;' and if we untwist one of the yarns, we arrive finally at the hempen fibres themselves, represented at e. It thus appears, that instead of twisting many hundreds or thousands of hempen fibres one round another, there are successive groups formed, each one augmenting the thickness of the rope previously produced; thus many fibres are spun into a yarn, many yarns into a strand, three strands into a rope, and three of these latter into a cable or cablet. Now for the reason of this. If a cable were formed at once of the individual yarns, twisted one round another, the outer layer would be necessarily exposed to more stress than the internal yarns, since the latter lie at less distances from the centre of the rope. When twisted together the outer yarns would form a spiral of a number of turns round the included yarns, being thereby much shortened; whilst the inner yarns would take only the same number of turns round a reduced axis, being thereby less shortened than the former; from whence it would follow that the outer yarns only would be in full tension, while those within would be more or less coiled up according to their proximity to the centre of the rope. The ultimate result would be, that the outer yarns would break long before the inner ones had borne their fair share of the strain to which the rope might be exposed. It is probable that in the primitive times of rope-making this rude method was adopted, and that it was gradually abandoned when the makers found that the yarns would bear more equally by building up the rope as it were piecemeal, and giving to each successive accumulation a twist in a direction contrary to that of its component parts.

The rope, then, is made at several successive stages, the first of which is the 'spinning' into yarn. At one end of the long rope-walk is a wheel, three or four feet in diameter, round which a band passes in such a manner as to give rotation to a number of small hooks or whirls disposed round a semicircular frame above the wheel. These hooks are from eight to twelve in number, and are each adapted for the spinning of one yarn. The spinners advance, generally in sets of four at a time, to the wheel, and commence that operation which, however simple, is often inexplicable to a bystander, and which we have here sketched. Each spinner has a bundle of hatchelled hemp round his waist, the double, or 'bight,' being in front, and the ends crossing each other behind. With his left hand he draws out a few fibres, and fastens them on one of the hooks. With
his right, which holds a piece of thick woollen cloth, he grasps these fibres. A man then turns the wheel, and the spinner walks backwards. It is curious to observe the effect of this double movement. The man draws out more and more fibres from his bundle as he recedes, and the number of fibres drawn out by each movement of the left hand, are all concerned in determining the thickness of the yarn produced. The men by long practice are enabled so to proportion their movements as to produce any given length of yarn from a given weight of hemp.

In this way the spinners continue to work for hours together, walking backwards while they are spinning the yarn, and forward while the yarn is being wound on a reel. Along the whole length of the ‘walk’ there are at intervals transverse beams overhead, into which hooks are driven; and on these hooks the yarns are suspended when it is necessary to prevent them from trailing on the ground. Each spinner can make about two thousand feet of yarn in twelve minutes. The number of fibres forming each yarn is never reckoned that of a yarn, say one-sixth or one-eighth of an inch about a thousand feet of yarn in twelve minutes. The state to which we have now traced our rope is made to contain about twenty pounds of yarn. The hemp is tarred (if tarred at all) after it has been spun into yarn, but before the yarns are twisted into strands. The reels of yarn are first ‘warped’ into a ‘haul’, that is, the yarns are unwound from the reel, stretched out straight and parallel, and assembled together in a large group called a ‘haul’. This haul frequently consists of between three and four hundred yarns, each a hundred yards in length; and in this state the hemp is tarred. In one of the buildings of the factory is a huge copper for containing melted tar. The haul dips in the tar, where it is left to become covered with a coating of some composition found necessary to bear his name. Without detailing the various steps by which improvements were introduced, we will at once proceed to the beautiful machine, which is the Lisieux warping machine, and the present front-piece. In a skeleton frame, concave towards the centre of the room, are a great number of ‘bobbins’, each loaded with yarn ready for being formed into a strand, and each being poised on a pivot so as to rotate
with facility. The ends of all these yarns, which may be twenty, fifty, eighty, in number, are made to pass through an equal number of small holes in a convex plate attached to the central machine, and then combined into one close group. This group next passes through a tube, whose diameter is such as to compress the yarns into close contact, and lastly is wound on a large reel attached to the machine. Meanwhile the twist is given to the strand by a remarkable arrangement. The whole of the mechanism, from the tube to the reel, rotates round an horizontal axis; and, in so doing, imparts a twist to the strand which is passing round the various wheels. The different adjustments are very beautiful. In the first place each bobbin, rotating separately on its axis, gives off just as much yarn as the strand requires; so that all become equally strained, by the outer yarns being somewhat longer than the inner. Then the arrangement of the holes in the plate, and of the tube, bring all the yarns to their proper position in the strand: and lastly, by changing the wheels in the machine, the strand becomes more or less hard, by twisting at a more or less acute angle. If the strand be drawn more swiftly through while the machine is revolving with a given velocity, the intensity or closeness of the twist is diminished; if less swiftly, then the twist is increased. The system for attaining any required intensity of twist is called the 'register,' in relation to the means for determining the exact degree of twist in the strand; and hence the whole process has come to be termed, in the technical language of the factory, registering.

A registered strand, or the strand produced by twisting the yarns together by this machine, is a smooth, uniform piece of cordage, all the yarns twisting round in one direction, and all contributing equally to the strength of the whole. Its thickness varies according to the purpose for which it is intended. Thus a strand for a twelve-inch cable contains eighty yarns, and is about an inch in diameter; while that for a smaller rope would be proportionally thinner. The nature of this machine is such that it can produce an endless strand; for if new bobbins are placed on the frame as fast as the old ones are exhausted, and if the strand is removed from the reel as fast as made, the machine, worked as it is by a steam-engine, may continuously add to the length of the strand.

There is another registering-machine of a larger size in the same building, for producing strands of greater diameter. There is also, in that part of the factory called the 'laying-walk,' a curious travelling-engine, which twists the strands of small diameter. At one end of this walk is a bobbin-frame, similar in principle to the one before noticed, and from this the several yarns proceed through a perforated plate, as in the other instance; but instead of being twisted by a machine which revolves on its own axis, the yarns are fastened to revolving hooks attached to a travelling-carriage, which moves in a railway farther and farther from the bobbin-frame as the strand becomes more and more lengthened. The railway extends probably a thousand feet in length; and the machine, which is about a yard long, travels from end to end of this railway in about half an hour, setting in rotation the hooks to which the yarns are attached.

It is not easy for a stranger at first to understand the technicalities of a rope-ery, for though the word 'twisting' would express the whole succession of steps, yet we hear of 'spinning' when the fibres are twisted into a yarn, 'registering' when the yarns are twisted into a strand, and 'laying' when the strands are twisted into a rope. We must accustom ourselves to the last of these terms in attending to the process next to be described.

In the 'laying-walk,' a revolving wheel, placed near one end, is provided with hooks wherein the three ends to form a rope are fixed (four being sometimes the number, but generally three). These hooks are made to rotate by any of the usual methods, such as turning a hand-winch connected with a wheel which acts on all the hooks, or bringing steam-power into action; both these methods being employed at the factory which is engaging our attention. At the other end of the walk all the strands are fastened to one hook, which revolves in an opposite direction to the others; and it is easy to conceive that this double movement would twist all the three strands round each other. But it is equally easy to see that this twisting would be very unequal, unless other appendages be employed; since the twist would be more close or hard near the ends than at the middle.

The annexed cut represents the singular contrivance for equalizing the hardness of the twist or 'lay.' A conical or rather beehive-shaped piece of wood, called a 'top,' is inserted between the three strands, grooves being cut in the surface of the top for their reception. This top, thus placed, prevents the strands from twisting except in the direction of its smaller end; while a man, stationed immediately behind, compresses the rope by a simple piece of apparatus, and causes the twist to become hard and firm. The top, as the rope closes behind it, is slowly urged on from one end to the other; if small, it is managed by a 'top-man,' but if large, it is supported on a carriage, as in our cut.

No difference exists in the making of a larger or a
smaller rope, so far as principle is concerned; the three strands are twisted round each other in the same manner, by apparatus more or less powerful, according to the size of the rope. As it is a natural consequence of the twisting process, that the rope should gradually shorten as it is formed, provision is made for this shortening in the arrangement of the apparatus. The wheel to which the three strands are fixed, on three separate hooks, is a fixture at one end of the "walk"; but the other end of the strands is fastened to a moveable sledge, which is so weighted as to travel gradually up the walk, just as fast as the rope diminishes in length.

A rope thus formed from three strands is the kind which most commonly meets our notice on land, and is technically known as 'hawser-rope,' or 'shroud-rope.' From three such ropes a cable, or cabinet, is formed in precisely the same manner; the three being fixed to three revolving hooks at one end, and one at the other; and a travelling 'top' being used to regulate and harden the twist. It may be well to remark, that ropes as ordinarily formed, that is, with three strands, do not require a 'heart,' or central strand, because the angles formed by the union of the three cylindrical strands are such that the pressure, in the operation of laying or closing the rope, causes the strands to fill up the central space completely; but when the number of strands exceeds three, a 'heart' is essential to keep them equidistant from the axis of the rope, and to fill up the vacancy that would otherwise be left by their not meeting in the centre. The heart however does not add proportionate strength to the rope, since its fibres, being straighter than those of the outer strands, yield in a different degree.

All arrangements, such as the above, produce ropes of a definite length, viz. the length of the rope-walk. But some machines have been constructed for 'laying' endless ropes, that is, not only effecting all this twisting and hardening by steam-power, but continuing the process to any required extent. For example, in the warehouse of the factory we saw a rope, about eight inches in circumference, and a mile and a quarter in length, which had been made by such a machine. Of these machines a magnificent series, constructed by the late Captain Huddart, now occupy a place in Her Majesty's Dock-yard at Deptford; they are for laying cables of the largest dimensions, and have attracted much attention from engineers. It is worthy of notice, however, in connection with these details, that iron chain-cables are now superseding hempen cables of large size; the latter being at the present day seldom made more than twelve inches in circumference, except for Her Majesty's Navy.

One of the upper buildings of the factory contains a powerful and curious machine for making flat ropes. These are ropes useful in mining operations, and consist of three or four well-made round ropes stitched together side by side. The operation of making these is simply a gigantic kind of thread-and-needle work; yet the force required renders the employment of a complicated machine necessary. Supposing four round ropes to form the flat rope, four reels are so placed that the ropes can unwind from them with facility, and pass side by side through a steam-heated box, where the tar becomes a little softened, and the ropes more easily worked. They next pass through a groove or a recess closed in tightly at top, bottom, and sides, except holes at the sides to admit the needles. A piercer, formed of a sharp-pointed rod of steel, probably a foot long and half an inch thick, is then forced entirely through the whole of the four ropes, by a leverage of enormous power; and a man immediately afterwards passes a needle and thread through the whole. When we say that this thread is a hempen-yarn sometimes half an inch in thickness, it will be readily conceived that the hole for its reception is a tolerably large one, and that no little force is required in drawing the thread tight. Two steel piercers are employed in succession, one on either edge of the rope, making diagonal holes through the four ropes; and two men, provided with needles and thread, pass the latter through the holes as fast as the piercers make them. There is mechanism at one end of the apparatus for drawing the rope forwards as fast as it is sewn. A small part of the arrangement, connected with the more immediate insertion of the needles, is shown in the adjoining cut.

The difference between the varieties of cordage, called twine, cord, string, rope, &c., is chiefly matter of detail; the actual formation by twisting being nearly the same in all. The finer and lighter kinds of twine are made of flax, others of fine hemp more carefully heckled than that for larger rope. The spinning here takes the place of subsequent processes in the rope-manufacture, for there is no 'registering' or 'laying' in fine twine. Generally speaking, the twine and small cord manufacture is, we believe, carried on only to a limited extent by the firms which make the large ropes for shipping; and it presents no marked features calling for our attention here.

Let us next take a rapid glance at the Sail-Cloth MANUFACTURE.

This department so far bears an analogy to that of the rope-manufacture, that vegetable fibres constitute the material of manufacture in both, and that these fibres are spun into a thread or yarn at an early stage.
in each manufacture. But beyond this point analogy ceases. Sail-cloth is the stoutest, the strongest, and the most durable of all varieties of flax fabrics. It is in fact a linen, so far as linen is a generic name for woven flax; but canvas is a more usual name. The powerful strain which the sails of a large ship are required to bear, renders necessary the employment of well-spun flax and well-woven yarns in the production of this fabric, from whence they are made. In the Royal Dock-yards the quality of the sail-cloth is closely attended to; and there is equal attention paid to the subject in the East India Company's shipping. In the merchant service generally, the quality is more or less excellent, according to circumstances; and any one who has glanced at the shipping below London Bridge will not fail to have remarked the strange medley of sails which the lower classes of vessels display.

Why is it that sails are not made of broad canvas, of a width somewhat analogous to that now employed by the floor-cloth manufacturers, we do not know; but the fact is that sail-cloth is woven only to a width of about two feet; so that a large number of joins is required for a large sail. It is not improbable that a greater size of material would be more expensive and that the sail from broad canvas than from that of narrower width, in consequence of the curved and inclined edges of the sails. Be that as it may, the custom seems to have been of long standing and general application, and as such we must view it.

The flax for making sail-cloth is not spun into yarn in all parts, as this process is executed in the flax-manufacturing districts of Scotland, from where the flax is purchased for the London market. The yarn comes to the factory in large bundles, made up of smaller hanks or skeins. It is of a light-brownish colour, and to undergo a washing and partial bleaching process before it is used for sail-cloth. For this purpose the bundles are taken to the 'bucking-house,' a building provided with various copper boilers, and large steeping-vessels. The yarn is thrown, in the first place, into hot alkaline liquor, composed of potash or pearlash in hot water, and then steeped for some time. From thence it is removed to a receptacle called a 'splash-mill,' somewhat resembling a fulling-mill, where it is beaten and worked about to free it from its impurities. To this is added a thorough rinsing or washing in a stream of running water. The water thus imbied by the yarn is next squeezed out by an hydraulic press; the yarn being put into a box, and pressure being there exerted on it, by which almost every semblance of moisture is expelled. But all this is merely preparatory; for the yarn is next subjected to a five-hours' boiling process, in a copper containing alkaline liquor. All these operations are, as may be supposed, very wet and not very cleanly; so that the 'bucking-house' is the least attractive part of the factory.

When all that alkaline liquor can remove is thus removed from the hemp, the skeins or hanks are hung out in the open air for several days to dry, and—in the act of drying—to bleach. This process goes on from the summit of the reservoir, has a singular appearance. A series of upright posts support two rows, an upper and a lower, of horizontal poles, on each of which the hanks are hung. As each of these poles runs out to a considerable extent, and as there are twenty or thirty of these frames or scaffolds ranged parallel one to another, the whole field looks like one mass of flax, extending from the ground to a height of about six feet. Here the flax remains about a week, exposed to the air, the action of which, combined with the previous washing and boiling, gives a considerable degree of whiteness to the flax. Near the bleach-field is a drying-shed, in which the flax is hung up in certain states of the weather. There is also a 'store-room,' in which the flax can be exposed to any required degree of temperature; this room has an iron floor, through which heat rises to warm the air of the room; and over head are poles or bars on which the hanks of flax are hung.

The material being washed, bleached, and dried, we next follow it to some of the inner buildings of the factory, where it is next subjected to the form of woven cloth. All which precedes the actual weaving is effected in one large apartment; and a remarkable apartment this is, both in reference to its general appearance and to the nature of the processes carried on therein. Most persons have a general idea of the nature of woven fabrics, of the long threads, or 'warp,' the short threads, or 'weft,' and the manner in which they mutually interlace. But the preparation of the weft and warp involves a few details not much known beyond the manufacturing districts.

First, for the weft threads. These are used in the shuttle, the movements of which to and fro in the act of weaving form the web. Each shuttle contains a little pivot or axle called a 'quill,' loaded with the yarn. These quills, in each machine, are of a different kind; some are used in the 'winding-room,' supplying these quills with yarn. In the old-fashioned process of hand-weaving the quills are filled by women or children, who use a humble-wheel to wind the yarn on them. The quill-machines, however, each of which is attended by one woman, have a considerable number of quills ranged in a row, and made to rotate rapidly. In the act of rotation the quills draw off yarn gradually from reels on which it had previously been wound; and the women renew the quills and the reels as fast as the one are filled and the other emptied. A comparison between this operation and that of winding on quills separately, as we saw it being done by a little boy for the hand-loom weavers in another part of the factory, illustrates strikingly the saving of time effected by the former. The little quills in the quill-machine, rapidly revolving and feeding themselves with yarn, require but little care from the attendant, who can manage a whole machine full of them at one time.

The yarns for the 'warp' are prepared for the weaver with more difficulty. At the entrance-end of the 'winding-room' we see four machines for winding the yarn on bobbins. The skeins of yarn are put on a kind of skeleton wheels about two feet in diameter, from whence they are transferred to bobbins about five or six inches long. Here everything seems to be in motion; the wheels or reels on which the skeins are placed, the bobbins for the reception of the yarn, and cylinders or rollers for pressing the yarn close to the surface of the bobbins.

But the most remarkable stage in the proceedings is the next following, of which we have endeavoured to give a sketch in the annexed cut. It is only by closely following the career of a thread through the machine that we can see what processes it undergoes. In the first place, as it passes between the newly filled and the empty bobbins, it is cut off from the reel, and then passed between two revolving rollers, the lowermost of which dips into a trough full of paste, by which every thread becomes soaked therewith. Then they pass between horse-hair brushes, one over and one under, each of which is as long as the whole length of the row of threads, and two or three inches wide. The effect of
this brushing is to equalize the paste on every separate yarn, very much more equally than it could be effected by a hand-brush. Then, without disturbing the parallel arrangement of the yarns, they are made to pass over a steam-heated copper box or cylinder, whereby the paste is partially dried; and immediately afterwards over a steam-heated iron box, when the drying is completed. The dried yarns next pass through the weaver's 'harness,' that is, small loops in a row of strings; and are lastly wound on the weaver's beam, ready to be put into the loom.

Nothing can exceed the regularity and order of this series of processes. The whole arrangement is about thirty feet long, that is, from the bobbin-frame to the warp-beam the yarn passes along that distance. The contents of all the eight or nine hundred bobbins are collected on one warp-beam, parallel, and in perfectly regular order. The yarn leaves the bobbins in a rough pliant state, and in a few seconds afterwards reaches the warp-beam stiffly starched and perfectly dry. The nine hundred bobbins are all revolving at once; so are the rollers; the paste-brushes have a brush-like kind of movement given to them, and the warp-beam is also revolving. Not only so, but the machine keeps its own accounts, for when a certain number of yards of yarn are wound on the beam, the machine rings a bell, and this gives the foreman an intimation which perhaps would not otherwise be so correctly given. There are in one room four of these large machines, four of the warp-winding machines, and three of those for quilt-winding; all worked by shafts, wheels, and bands from an engine below.

The warp being filled by one sort of machine, and the shuttle-quills by another, we descend to a lower room, and witness the combination of the two sorts of yarn into cloth. Whoever has been to the Polytechnic Institution may have seen there a power-loom, and may have noticed the mode in which such complicated machines work. Forty of these, as we have before stated, are at work in the weaving-room of the factory, and may, from the noise which they create, give a foretaste of the giant establishments at Manchester. The machine throws its own shuttle, moves its own assemblage of warp-threads, drives up the weft-threads as fast as they are thrown, and winds the woven canvas on a roller. One woman is able to manage two power-loom, to supply warp and weft, mend broken threads, and remove the finished material.

Besides the power-loomos, there are in the factory a considerable number of hand-loomos also at work. The semi-scientific exhibitions in London have made these as well as the power-loom tolerably well known; and many a person has probably been surprised at the patience with which a man can sit for hours at a time throwing a shuttle alternately with his right hand and his left, moving a suspended bar alternately to and from him, and treading alternately on a lever with one or the other foot, and may have perhaps pondered how many movements of hand, arm, and foot must be made before a shilling can be earned.

One more process, and our sail-cloth is finished. It is taken to a 'receiving-room,' where it is examined, lumps and irregularities removed, measured, and weighed. In one part of the factory is a 'calendering' machine, through which all the canvas then passes. This machine consists mainly of one iron and two wooden rollers, which are made to approximate more or less closely together, according to the pressure intended to be given. The canvas is drawn between these rollers, and comes out flat, smooth, dense, and slightly glossy at the surface. It is then made up into compact parcels, called 'bolts,' in which form it passes into the hands of the sailmaker. A few particulars of this last-named occupation were given in the Supplement for June, 1841, and need not be repeated here. Sails are made at this factory, but for the most part the material leaves the establishment in the form of bolts, stamped and numbered.

This rough outline may perhaps have given a general idea of these two branches of manufacture; partially connected in some of their earlier stages, and closely connected in respect of their united importance to shipping.
Riding to Market.

**IRISH SKETCHES.—No. III.**

**THE COUNTRY GIRL.**

The sketch accompanying the present notice was taken from a very pretty country lass, seated, as she is represented, on her pony, between two panniers, or *kishes*, containing potatoes and a few eggs. The form of the baskets will be seen to differ altogether from the ordinary pannier: they are slung over a pad of twisted straw by ropes of the same material. The dress of the girl was the usual blue cloak, without either shoes or bonnet. She seemed a person of respectability, a little sun-burnt, and slightly freckled, with a mouth full of white teeth, and her laughing light-grey eye thickly fringed with long black eyelashes. She was what she looked to be, a small gardener's or cottager's daughter, carrying her little stock to Bantry, where there was a market. In making the sketch, it was not observed till long afterwards that the girl was sitting on the wrong side of the pony. When this was discovered, the sketch was put aside as the unlucky selection of an accidental rather than the ordinary mode of ladies' travelling; but on reading over Spenser, it was found that this very point had been a matter of grave remonstrance in the days of Elizabeth; and that the Irish ladies, with characteristic obstinacy, pleaded custom, the habits of their mothers and grandmothers, and resisting all advice, remained steadfast in their error. Moreover, the manner of their women riding on the wrong side of the horse, I mean with their faces to the right side, as the Irish use, is (as they say) old Spanish, and some say African, for so amongst them the women, they say, used to ride."

This sort of pannier is used all over the south and west of Ireland for the carriage of eggs, potatoes, turf, &c. When lifted out of its swing, it is set on its end by the hearth, and serves as a receptacle for the turf used for firing, and is called a turf-kish. A woman from Cork may be met with a basket of this kind swung across her back thirty miles from home, collecting eggs from the cottages, which she carries to Cork for sale, often knitting as she goes on her solitary pilgrimage.

Whatever may be the case as to the mode of riding, the cloak is not likely to go out of fashion; but in other parts of Irish female costume the cheapness of cotton prints has already effected some changes, and, it may be added, improvements, since greater cleanliness is promoted. The late Mr. Inglis, in his "Journey throughout Ireland," notices that for gowns Waterford stuff used to be the common material, and a gown made of this would last six or seven years; and during all that time, the pin that fastened it up behind was "Spenser's View of the State of Ireland."
never taken out.' When at Thomastown, county Kilken- 
y, the same writer speaks of the fashions of a coun-
y woman," he says, "wears a cloak; and the hood of every cloak is thrown over the head, unless the cap underneath be an extremely smart one, in which case the hood is allowed to fall a little back; or if the cap be a non-such, it is altogether exposed. The habit of covering the head appears to be universal. If a girl is not possessed of a cloak, she will borrow the shelter of an apron, or even of a petti-
coat, like the women of La Mancha." Mr. Inglis saw 
also a resemblance of the Spanish costume in the dress of the men in this part of Ireland. The day was dry and mild, but almost every man wore a greatcoat.

The greatcoat, however, and the fashion of wear-
ing it, are by no means modern innovations. John 
Derrick, in 'The Image of Ireland,' 1581, describes 
both the cloak and the coat as follows:

"With jackets long and large, 
Which shroud simplicity:
Though spiteful darts which they do bear
Import iniquity.
Their skirts be very strange,
Several under each reaching past the thigh:
With plaits on plaits they plated are,
As thick as plaits may lie.
Whose sleeves hang trailing down
Almost unto the shoe;
And with a mantle commonly
The Irish kenne do go.
Now some amongst the rest
Do use another weed:
A coat. I mean, of strange device,
Which fancy first did build breed.
His skirts be very short,
With plaits set thick about."

This is the same apparently as the "jacket" before mentioned. The trait of allowing the sleeves to hang down unoccupied is a curious custom to have endured so long.

USEFUL APPLICATIONS OF GEMS.

The hard specimens of stone, which by the common 
consent of the majority of nations have always been 
deemed 'gems,' or 'precious stones,' are susceptible of 
several useful applications, due to the decorative 
worth to which they are generally applied. The 
qualities which give to gems a practical value in the 
arts and sciences are principally hardness and high re-
fractive power; respecting both of which a few remarks 
may here be offered.

The hardness of gems, by contributing to indestruct-
ibility, gives to them a considerable portion of their 
value as a marketable commodity, and imparts to them, 
as materials for manufacture, an importance which 
counterbalances their excessive high price. The jewel-
ing of watches may be taken as an illustration. This 
jewelling, as is well known, refers not to the external 
adornment of a watch, but to the employment of jewels 
for the bases of pivot-holes. Among the numerous 
wheels and pinions employed in a watch, some are ro-
tatory to so vast an amount, that the ends of the pivots 
wear away any metallic substance in which the pivot 
works; even the hardest steel gives way to this un-
interrupted friction. Hence, in the best watches, jewels, 
such as diamonds, rubies, sapphires, and chrysolites, are 
employed; and the smaller, in the pivot-plates; and this is 
done, not merely for beauty, but for usefulness, as we are 
acquainted, and therefore better prepared to 
resist the wear by friction.

Great difficulty is experienced in working these hard 
gems. To grind, polish, turn, drill, and set them into 
the frame-work of a watch, requires all the skill of the 
'watch-jeweller.' The process requires the aid of a

small lathe, small gravers, diamond-dust, small frag-
ments of diamond called 'bort,' and turning-tools made 
by cementing small pieces of this 'bort' into a notch 
made in the end of short brass wires fixed to a handle.

The user is guided in holding it in the right position 
according to the amount of pressure exerted on it in 
the act of writing. It has been often asserted, and is

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perhaps true, that pens of this costly character, if prevented from collision with hard substances, and if washed occasionally with soap and water, become, from their long duration, really economical pens; but the original cost is so great as to have prevented them from coming into general use. It is for the preservation of these jewelled pens that Mr. Doughty some years ago contrived an inkstand lined with India-rubber, the soft texture of which prevents the nib of the pen from injury when dipped into the inkstand.

A peculiarly valuable application of gems is in the form of a small diamond or gem of particular form in a microscope, doubtless, as he observes, "the this lightismore abundant from a piece of diamond first time this precious gem had been employedin than from a piece of glass of the same size and shape.

He began upon a small diamond, to which it was proposed to give the curves which in glass would produce the admission of instruments for dissection, and not the professed diamond-workers, they candidly owned that they were not acquainted with any means whereby such a figure could be given to the diamond. No less than fifty or sixty hours' labour is required to grind a tiny diamond into a double-convex form; and the minuteness of the whole affair may be judged from the following remark of Mr. Pritchard: — "Notwithstanding these difficulties, and the consequent expense and labour they entailed on me before sufficiently experienced in working upon this refractory material with certainty, I have now the satisfaction of being able, by inspection à priori, to decide whether a diamond is fit for a magnifier or not; and have now executed two lenses and a plano-convex made of crystal, of which the strength is quite perfect for microscopic purposes. One of these is about the twentieth of an inch focus, and is now in the possession of his Grace the Duke of Buckingham; the other, in my hands, is the thirtieth of an inch focus, and has consequently amplification enough for most practical purposes."

Before Mr. Pritchard began the working of diamond lenses, Sir David Brewster had succeeded in having lenses formed of ruby and garnet by an optician of Edinburgh; and at subsequent periods he employed garnet lenses made by several different artists. It may at once occur to a reader to ask, "How can a coloured gem be available for a microscope lens?" On this point Sir David Brewster has expressed that the garnet lenses exhibit minute objects with admirable accuracy and precision: — "We can state with confidence that we have never experienced the slightest inconvenience from the colour of the garnet, which diminishes with its thickness, and consequently disappears almost wholly in very minute lenses."

The sapphire is, in refractive power and many other properties, nearly equal to or superior to the ruby, differing from it chiefly in colour; and Mr. Pritchard has formed many lenses of sapphire, which, though inferior to those of diamond, are said to be vastly superior to any made of glass for microscopic purposes. The relative powers of the three substances, diamond, sapphire, and glass, as microscopic lenses, may perhaps be conveniently shown in this way: that if the curvature, or the focal distance of a glass lens, be reckoned as 3, then the curvature or focal distance of a sapphire lens having the same magnifying power will be 5, and of the diamond lens 8; the gem lenses being thinner, and having their focal points farther off, than the glass lens. One useful effect of the longer focal distance in a gem lens to project a minute object upon a surface, in such a manner that the glass the thickness of the glass, such that there is no room between its anterior surface and the object for the admission of instruments for dissection, and not even for the thinnest plate of glass; so that it is impossible to use glass lenses of small focs in viewing objects placed in glass slides. It may not be amiss to mention that the high refractive power of gems, particularly the diamond, by which they are fitted for microscopic application, is in itself one of the chief sources of their brilliancy and beauty, for which they are sought after with such avidity as personal ornaments. The mode in which light, falling on a transparent substance, is partly reflected from the surface and partly transmitted through the body, determines greatly on this point, that in the case of glass the thickness of the glass is such that there is no room between its anterior surface and the object for the admission of instruments for dissection, and not even for the thinnest plate of glass; so that it is impossible to use glass lenses of small focs in viewing objects placed in glass slides.

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He then set about another, selecting a rose-cut diamond, which, to save labour, he proposed to form into a plano-convex instead of a double-convex lens, that is, to have one side flat instead of both sides curved. In the progress of working this stone, the heat generated by friction repeatedly melted the shell-lac, the cement was better able to resist the fusing effect of the heat. He succeeded in working the gem to the required form, and using it as the lens of a microscope, "doubtless," as he observes, "the first time this precious gem had been employed in making manifest the hidden secrets of nature."

Mr. Pritchard showing a diamond lens thus made to the professed diamond-workers, they candidly owned that they were not acquainted with any means whereby
THE CHAR.

The habits of the salmon genus are more diversified than those of many other fish, and hence they have naturally attracted greater observation; but notwithstanding this, the number of those who are able to distinguish the different species and varieties is small. Even in the same water there may be found singular varieties of the same species, originally occasioned, as Sir Humphry Davy suggests in his 'Salmonia,' by food, peculiarities of water, &c.; the qualities which these produce being, as he observes, "transmitted to the offspring, and produce varieties which retain their characters as long as they are exposed to the same circumstances, and only slowly lose them." He adds, "Plenty of good food gives a silvery colour and round form to fish, and the offspring retain these characters. Feeding on shell-fish thickens the stomach, and in many generations, probably, the gillaroo-trout becomes so distinct a variety as to render it doubtful if it be not a distinct species." Again, salmon at different ages undergoes changes which render the identification of the species one of considerable difficulty. In No. 334 we have stated the difficulties which attend this task. The char is the least common of the salmon genus. When Walton published his 'Angler,' he stated his belief that it was only found in Lake Windermere; but it is now known to be more widely distributed. Other English lakes besides Windermere contain char; and it is found in the lakes in Wales, in the Scotch lochs, and in Lough Esk in Ireland. The lakes of the Tyrol are famous for char. Speaking of the char, Sir H. Davy says,—"They generally haunt deep cool lakes, and are seldom found at the surface till late in the autumn." At this period they will take either fly or minnow, and he mentions as something remarkable having caught a char in summer in one of the beautiful, small, deep lakes of the Upper Tyrol, "but it was where a small cool stream entered from the mountain; and the fish did not rise, but swallowed the artificial fly under water."

The char is a very beautiful fish as well as excellent for the table, combining the flavour of the trout with that of the mullet. It is a great delicacy when potted.

As it may be some time before we again notice any of our British Fishes, we take the opportunity of giving Sir Humphry Davy's summary of the various attractions of angling, and the reasons why it has not unfrequently been pursued with ardour by poets and philosophers:—"The search after food is an instinct belonging to our nature; and from the savage in his rudest and most primitive state, who destroys a piece of game, or a fish, with a club or spear, to man in the highest or intellectual state; and the fisher for salmon and trout with the fly employs not only machinery to assist his physical powers, but applies sagacity to conquer difficulties; and the pleasure derived from ingenious resources and devices, as well as from active pursuit, belongs to this amusement. Then as to its philosophical tendency, it is a pursuit of moral discipline, requiring patience, forbearance, and command of temper. As connected with natural science, it may be vaunted as demanding a knowledge of the habits of a considerable tribe of created beings—fishes, and the animals that they prey upon, and an acquaintance with the signs and tokens of the weather and its changes, the nature of waters, and of the atmosphere. As to its poetical relations, it carries us..."
into the most wild and beautiful scenery of nature; amongst the mountain lakes, and the clear and lovely streams that rush from the higher ranges of elevated hills, or that make their way through the cavities of calcareous strata. How delightful in the early spring, after the dull and tedious time of winter, when the frosts disappear and the sunshine warms the earth and waters, to wander forth by some clear stream, to see the leaf bursting from the purple bud, to scent the odours that rush from the cheery, peachy, when the wood is imported in great quantity for this nomenclature.

PLANTS USED IN DYEING YELLOW.

In glancing at some of the more important plants used to produce a yellow dye, it will be sufficient to confine our attention principally to weld, fustic, quercitron-bark, turmeric, and annatto, the remaining kinds being of more limited application.

Weld is a plant of which the leaf and stem yield the colouring-matter employed by the dyer, the stem rising from one to three feet in height. It is a native of Britain; it flowers in June and July, and ripens its valuable yellow dye. Its price is moderate, the colour it imparts is of more limited application.

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Quercitron-bark was first introduced as a yellow-dye ingredient by Dr. Bancroft about seventy years ago. He obtained a patent for the discovery in 1775; but the American war breaking out soon afterwards, he was deprived of its advantages. In consideration of this circumstance, parliament passed an Act in 1785, securing to him the privileges conveyed by his patent for fourteen years. At the expiration of the latter period the House of Commons agreed to extend the privilege for an additional period of seven years; but the House of Lords rejected the bill. The result was that Dr. Bancroft reaped but little benefit from a discovery which has been largely beneficial to our manufacturers.

The material is the bark of the Quercus nigra, or Quercus tinctoria. The bark consists of three coats: a black exterior, which Bancroft supposed to have been concealed from Linnaeus the yellow colouring-matter; secondly, a middle or cellular coat, in which the colour-matter principally resides; and thirdly, an interior or cortical part, containing a smaller portion of yellow, or substance. The yellow exterior coat is of a little of the yellow; but as this is impure and of a more dull colour, the black coating is shaved or scraped from the remainder. When this is done, and the remaining cellular and cortical parts are ground by millstones, they will separate partly into a light fine powder, and partly into stringy filaments or fibres, which last, but a little of which is used as the powder. The two component parts, namely, the fibre and the powder, are recommended to be used in the same proportions in which they occur in the tree, as affording the means of obtaining the greatest quantity of the colouring substance. Bancroft states that the quercitron-bark will yield, weight for weight, eight times as much colouring-matter as the wood of a tree, and four times as much as fustic. This colouring-matter is readily extracted by hot water, and is said to weigh about one-twelfth part of the bark from which it has been obtained.

Annotto or Anatto is a yellow colouring-substance, which has gained notoriety rather for its property of dyeing sour milk, and of imparting cheese and butter, than for dyeing cloths; but it has been long used for the latter purpose likewise. It is a kind of red paste obtained from the berries of the bixa orellana, a South American plant. This plant produces oblong hairy pods, somewhat resembling those of the chestnut, and within each of these are thirty or forty irregularly-shaped seeds, enveloped in a pulp of a bright red colour, and containing a medicinal substance. This pulp was formerly used as paint by the Indians; but it is now made commercially valuable. The seeds, together with the red tough matter that surrounds them, are softened with water in a wooden trough, until the kernels are separated from the pulp by a kind of fermentation, which is accompanied by a very nauseous smell. The mass is then strained through a sieve, and boiled: upon which a thick reddish scum separates, and it is this which forms the colouring-substance. After being skimmed and cooled, it is moulded into roundish lumps, wrapped round with leaves of trees, and packed for sale. Another mode of procuring the colouring-matter is by steeping the pods in water, extracting the seeds, and leaving the pulp to subside; the fluid being subsequently drawn off, the residuum, with which oil is sometimes mixed up, is placed in shallow vessels and gradually dried in the shade.

The annotto of commerce is of two kinds, viz. flag or cake anotto, and roll anotto. The first is the most important, and is furnished almost wholly by Cayenne; it comes to us principally by way of the United States, in square cakes weighing two or three pounds each, and wrapped in banana-leaves. When well made it is of a bright yellow colour, soft to the touch, and of a good consistence. It is used by the dyers for imparting a deep orange tint to silk and cotton; and we might thus have included it among the red dyers, but it has been ranked by Dr. Thomson among the yellow series. In fact it has been found by Chevreul that anotto contains two different colouring-matters, the one yellow and the other red. The yellow colouring-matter is soluble in water and alcohol, and slightly in ether. The red colouring-matter is scarcely soluble in water, but it dissolves in alcohol and ether, communicating to these liquids an orange-red colour. The dye which anotto gives to silk and cotton is said to be rich and brilliant, but not permanent.

It is the flag or cake anotto which is used by the dyer. The roll anotto, brought principally from Brazil in small rolls not exceeding two or three ounces in weight, is hard, dry, compact, brownish on the outside, and of a beautiful red within. Of the roll anotto Mr. M'Culloch states, "it is the best of all ingredients for the colouring of cheese and butter, and there is none so much used as anatto. It is employed by some of the Indians; but it is now made commercially valuable in the British and in some of the continental dairies. In Gloucestershire it is the practice, to allow an ounce of anotto to a hundredweight of cheese; in Cheshire eight pennyweights are reckoned sufficient for a cheese of sixty pounds. When genuine, it neither affects the taste nor the smell of cheese or butter, and is only employed in the latter purpose. It is a kind of red paste obtained from the chocolate, to which it imparts a beautiful tint." Turmeric is the root of a tree called the curcuma longa, growing principally in Bengal, Java, and China. It is externally greyish, and internally of a deep yellowish or saffron colour, very hard, and not much unlike ginger in size and shape. It has a very astringent, slightly acrid, and somewhat warm taste. It readily gives out its colouring ingredient both to water and to spirit, communicating to the former a deep yellow, and to the latter a yellowish red tint. Turmeric was formerly in considerable estimation as a medicine; but in Europe it is now employed almost as a dye. It possesses a beautiful bright yellow colour, which, however, is extremely fugitive, and of little use for dyeing. A plant called 'dyers' broom' is occasionally employed in dyeing stuffs of the coarser kinds. So also are the bark of the American hickory, the leaves of the sweet-willow, the seeds of the purple trefoil, saffron, chamomile, sumach, the three-leaved hellebore, and other plants. But these are of such partial application that they need not be dwelt on.
the dignities, or, in other words, with the rank of the possessor. Thus Emperor, King, Czar, Prince, are titles of honour, and the possessors of the high dignities represented by these words are, by the common consent of the civilized world, entitled to be so designated, and to be addressed by such terms as Your Majesty and Your Royal Highness. These are the terms used in England, and the phrases in use in other countries of Europe do not much differ from them. In fact one European nation seems to have borrowed from another, or all to have taken their titles of honour for this exalted rank from a common original; so that little need be said to have sanction of the ancient terms of address. They can be traced in the terms by which they show their respect for the persons of highest dignity. But it is different when we come to compare them with the Oriental nations. In those seats of antient civilization the most extravagant terms of compliment are in use, and a little sovereign of a wandering tribe rejoices in titles of honour, numerous and inflated to the highest degree. In the series of Roman emperors, the word Caesar, originally the name of a family, became a title of honour; Augustus was another; and Pater Patriae a third.

The five orders of nobility in England are distinguished by the titles of honour, Duke, Marquis, Earl, Viscount, and Baron: and the persons in whom the dignity of peerage is vested in England are entitled to the titles signified by these words; and if in any legal proceedings they should be otherwise designated, there would be a misnomer by which the proceedings would be vitiated, just as when a private person is wrongly described in an indictment; that is, the law or the custom of the realm guarantees to them the possession of certain rights of honour, as at least of the dignity to which they correspond. They are also entitled to be addressed by such phrases as My Lord, My Lord Marquis, My Lord Duke; and they have usually prefixed to their titles, properly so called, certain phrases, as High and Mighty Prince, Most Noble, Right Honourable, varying with the kind and degree of the dignity possessed by them. The other members of the families of peers of the name of borough, who are hereditary, and lady of a peer has rank and titles corresponding with those of the husband. All the sons and daughters of peers are Honourable, but the daughters of earls and peers of a higher dignity are entitled to the distinction of being called Lady, and the younger sons of dukes and marquises are by custom addressed as My Lord. The position which honour gives in society has always made them objects of ambition; and it may be questioned whether, as far as there has been any feeling in operation besides that of a sense of duty, the great exertions which are made in the service of the country are not stimulated less by the expectation of pecuniary reward, than by the hope of receiving one of these titles of honour which shall descend to a man’s posterity. They cost nothing; and hence it is that titles of honour have been called "the cheap defence of nations."

Whoever wishes to study this subject in all its details will do well to resort to two great works: one, the late Reports of the Lords' Committees on the dignity of the Peersage; the other, the large treatise on ‘Titles of Honour,’ by the learned Selden. The latter was first printed in 4to., 1614; again, with large additions, folio, 1631.

**Artificial Lakes in Ceylon.**—The Candelay Lake is situated within thirty miles of Trincomalee, in an extensive and broad valley, around which the greatest part of the distant hills that envelop it. In the centre of the valley a long causeway, principally made of masses of rock, has been constructed to retain the waters that from every side pour into the space enclosed within the circumjacent hills and the artificial dam thus formed. During the rainy season, when the lake attains its greatest elevation, the area of ground over which the inundation extends may be computed at fifteen square miles. This work of art, and others of nearly equally gigantic proportions in the island, sufficiently indicate that at some remote period Ceylon was a densely-populated country, and under a government sufficiently enlightened to appreciate, and firm to enforce between the knight, in its ordinary sense, and the baron. The Baronet, which is quite a new dignity, not having been known before the reign of James I., has, besides its name, which is placed after the name and surname of the person spoken of, the privilege of prefixing Sir; and their wives are entitled to the prefix of Dame, and to be addressed as My Lady and Your Ladyship.

Besides these, there are the ecclesiastical dignities of Bishop and Archbishop, which bring with them the right to certain titles of honour besides the phrases by which the dignity itself is designated. And custom compels them to have sanction of the ancient terms of address. They possess inferior dignities in the church to certain honourable titles or compliments, and it is usual to bestow on all persons who are admitted into the clerical order the title of Reverend.

There are also academical distinctions which are of the nature of titles of honour, although they are not usually considered to fall under the denomination of nobility. Municipal offices have also titles accompanying them; and in the law there are very eminent offices the names of which become titles of honour to the possessors of them, and which bring with them the right to certain terms of distinction.

All titles of honour appear to have been originally names of office. The earl in England had in former times a sense of dignity and respect attaching to the title, and the sheriff (the Vice-Comes or Vice Earl) has now; but the name has remained now that the peculiar duties are gone, and so it is with respect to other dignities. The emperor or king, the highest dignity known in Europe, still performs the duties which originally belonged to the office, or at least the most important of them, and are sufficient to dignify, and honours; and on the Continent there are dukes and earls who have still an important political character.

Some of these dignities and the titles correspondent to them are hereditary. So were the eminent offices which they designate in the remote ages, when there were duties to be performed. Hence hereditary titles. The distinction which the possession of titles which shall the name has remained now that the peculiar duties are gone, and so it is with respect to other dignities. The emperor or king, the highest dignity known in Europe, still performs the duties which originally belonged to the office, or at least the most important of them, and are sufficient to dignify, and honours; and on the Continent there are dukes and earls who have still an important political character.

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of water is poured on the burning materials. At one moment, when a portion falls in, the glare is deadened; at the next, the flame bursts forth with redoubled energy. More and more engines tear along to the lurid spot; more and more spectators assemble; everyone asks, and no one can answer, how the fire shall be quenched. The engines arrive; the hard crust of water is broken; the horses fall; the firemen, stinging with the heat, are raised out of their seats...
FROISSART AND HIS CHRONICLE.

No. XI.

A few years after his visit to Gaston de Foix, the historian determined to visit England. He was now nearly sixty years of age, but his spirit was as young and indefatigable as ever. It is impossible to behold without admiration the unwearied diligence of Froissart to make his great history correct, or without sympathy the enthusiasm which made the most toilsome journeys only so many labours of love. As an instance of the former quality, so indispensable to writers who would honestly assume all the serious responsibilities of history, we may here mention an interesting anecdote. When, about 1390, he began the composition of his third volume, in which he had to write of the wars of Castile, he suddenly remembered that his materials, however ample, had been received from Spaniards and their allies the Gascons only; so he stays his narration till he obtained the views and statements of the other party so materially concerned—the Portuguese. On inquiry he learns that some Portuguese are at Bruges; he goes thither, where he is informed that a knight of that nation, “a valiant and wise man, and of the council of the king of Portugal,” had just arrived at Middleburgh in Zealand, in his way to Prussia, to join in the war against the Turkish infidels. To Middleburgh immediately starts Froissart, where he finds the knight, and is well received by him. Froissart now obtains such abundant information, that he immediately returns to his own country to finish his volume, and to leave on record his delight at the result of the journey he had taken. Of the number and variety of his journeys it is difficult to form a sufficiently just conception, unless perhaps by the statement, that wherever there was anything of more than ordinary moment going on in Europe, there in all probability would Froissart be. It may not be uninteresting to trace his known movements for two or three years after leaving Orchies. He departed from thence in the train of the Countess of Boulogne, who
Froissart was at a place called Kinsman, which was near Avignon, where the countess met her husband, the Duke of Berry, and where they were married. Froissart composed a poem in honour of the event. He next went to Paris and from there to the court of King Edward, where he was received with great honour. He afterwards went to Paris, where he witnessed the splendid entrance of Isabel of Bavaria, prior to her marriage with the young French king; then again to Avignon, to behold the meeting of the emperor and the pope, &c. It is our knowledge of these things that compels us to believe that the most romantic of historians must be also the most true. True it was, that I, Sir John Froissart, as at that time treasurer and canon of the church of Chimay, in the county of Hainault, in the diocese of Liege, had great affection to go and see the realm of England, when I had been in Abbeville, and that to see the country, thinking therein I should live much longer, I had not been there twenty-seven years before; and I thought though I saw not those lords that I left alive there, that at the least I should see their heirs, which should do me much good to see, and also to justify the histories and matters that I had written of them. For these causes and others I had great desire to go into England to see how it was that in the north and south there were horses and other necessaries, I passed the sea at Calais, and came to Dover the 12th day of the month of July (1395). When I came there I found no man of my knowledge, it was so long since I had been in England; and the houses were all newly changed, and young children were become men, and the women knew me not, nor I them. So I abode half a day and all a night at Dover. It was on a Tuesday, and the next day by nine of the clock I came to Canterbury to St. Thomas's shrine and to the tomb of the noble Prince of Wales, who right richly, there I heard mass, and made my offering to the holy saint. And there I was informed how King Richard should be there next day on the pilgrimage, which was after his return out of Ireland, where he had been the space of nine months or thereabouts. The king had a devotion to visit St. Thomas's shrine, also because the prince his father was there buried, and I thought to abide the king there; and so I did.

And the next day the king came thither with a noble company of lords, ladies, and damsel. And when I was among them they seemed to me all new folk. I knew no person. The time was sore changed in twenty-eight years. And with the king, as then, was none of his uncles; the Duke of Lancaster was in Aquitaine, and the Dukes of York and Gloucester on other businesses; so that at first I was all abashed. For if I had seen any ancient knight that had been with King Edward or with the prince, I had been well recomposed; but I could see none such. Then I demanded for a long time why they were not there, as I thought they were alive or not. And it was showed me, 'Ye,' but he was at London. Then I thought use to go to the Lord Thomas Percy, great seneschal of England, who was there with the king: so I acquainted me with him, and I found him right honourable and gracious. And he offered to present me and my letters to the king, whereof I was right joyful; for it behoved me to have some means to bring me to presence of such a prince as the King of England was. He went to the king's chamber, at which time the king was gone to sleep; and so he showed me, and bade me return to my lodging and come again. And so I did; and when I came to the bishop's palace, I found the Lord Thomas Percy ready to ride to Ospringe, and he asked me to come with him of his journey the next day. I being there, but to follow the court. And he said he would cause me ever well to be lodged till the king should be at the fair castle of Leeds in Kent.

I ordered me after his counsel, and rode before to Ospringe. And by adventure I was lodged in a house where was lodged a gentle knight of England, called Sir William Lisle. He had tarried there behind the king, because he had pain in his head all the more part of my coming thither, all that the Lord Thomas Percy had said to me and ordered me to do. He then answered me, and said how I could not have a better man, and that on Friday the king should be at the castle of Leeds. And he showed me that when I came there I should find there the Duke of York, the king's uncle; whereof I was right glad, because I had letters directed to him, and also that in his youth he had seen me in the court of the noble King Edward his father and the queen his mother.

Then on the Friday in the morning Sir William Lisle and I rode together, and thus we rode to Leeds, and thither came the king and all his company. And there I found the Lord Edmund, Duke of York. Then I went to him; I delivered my letters from the Count of Hainault, and from the Count of Ostrevant. The duke received me well, and made me good cheer, and said, 'Sir John, hold you always near to us, and we shall show you love and courtesy: we are bound thereto for the love of time past, and for love of my lady the old queen my mother, in whose court we were; we have good remembrance thereof. Then I thanked him, as reason required. And I then advanced by reason of him and Sir Thomas Percy and Sir William Lisle; by their means I was brought into the king's chamber, and into his presence by means of his uncle the Duke of York. Then I delivered my letters to the king, and he took and read them at good leisure. Then he said to me that I was welcome, as one that had been and is of the English court. As on that day
The making of this article depends, in a great measure, on the weather. During about four months in the summer, salt is manufactured. The salt water is first let into square level shallow places formed in a field adjoining the sea: these shallow places are called brine-pan. The brine-pan in the fields vary in size from three rods square to a quarter of an acre. In fine weather the salt water becomes brine in about seven days. It is then pumped up by a wind-pump with sails into four reservoirs or pits, each holding about five thousand bushels. Five tons of salt a day from these pits the brine is pumped into the pans in the house. The brine is then boiled for twelve hours, there being a fire under each pan. During the boiling it is twice skimmed; first one hour after it has commenced boiling, and again at the end of the fourth hour. As soon as the brine has been first skimmed, the crystals of salt may be perceived rising to the top, from whence they fall into the pans, and are kept in the English court, which we find in his fourth and last volume. All this while Froissart was anticipating the pleasure of presenting his fair book, with its velvet cover, and silver and gilt clasps; and after a few days stay at Eltham his desire was gratified. On the Sunday following all such as had been there departed, and all their counsellors, except the Duke of York, who abode still about the king, and Sir Thomas Percy and Sir Richard Stacey showed my business to the king. Then the king desired to see my book that I had brought for him; so he saw it in his chamber, for I had laid it there ready on his bed. When the king opened it, it pleased him well, for it was fair illuminated and written, and covered with crimson velvet, with ten buttons of gold, and roses of gold in the midst, with two silver clasps gilt, richly wrought. Then the king demanded of me whereof it treated, and I showed him how it treated of matters of love, whereof the king was very glad. And he looked into it, and read it in many places; for he could speak and read French very well. And he gave it to a knight of his chamber named Sir Richard Credon, to keep it in his secret chamber.

Froissart, after this gracious reception of his literary labours, stayed some time with the king, "not always in one place; for the king oftentimes removed to Eltham, to Leeds, to Kingston, to Sheen, to Chertsey, or to Windsor, about the marches of London." From England Froissart returned to complete the last portion of his Chronicle, little expecting, we may be sure, the nature of the last momentous event he would have to record in it,—the deposition and death of the English monarch who had shown him so much kindness and courtesy, and the elevation of Bolingbroke to the throne. With a notice of that event, which will form the subject of our next paper, we shall terminate the present series; for there also does the historian end his great work.

SALTERS.

The only branch of trade on the island [Hayling, near Portsmouth] is the manufacture of salt, which, it appears, before the Conquest and the inhabitants have always been famous for the great superiority of this article in foreign markets.

St. Augustin, among others, celebrates the great excellence of the salt manufactured round the shores of the Helingey island, which was in his time superior to all the salts of the British coasts.

In this article depends, in a great measure, on the weather. During about four months in the summer, salt is manufactured. The salt water is first let into square level shallow places formed in a field adjoining the sea: these shallow places are called brine-pan. In one, the Saltern, ten acres of ground are occupied for this purpose. The boiling-house, where the brine is boiled, contains five large square shallow pans of sheet-iron. The brine formed on two acres of ground is sufficient to supply one boil-
THE ASH.

Next to the oak, the ash is the most valuable of all our trees. If the oak be regarded as the king of trees and the Hercules of the forest, the ash may fairly claim supremacy as their queen, and Gilpin terms it the Venus of the woods. Its trunk is not so giant-like as the oak, but it frequently attains a greater height. The oak is pre-eminently useful for ship-building and all purposes in which great durability is required; and the ash, for the variety of agricultural and useful common purposes in which it is employed, is sometimes called the "husbandman's tree." Evelyn says—"in peace and war it is a wood in the highest request." He here alludes to pikes, spears, and bows having been anciently made of ash. Except the roots, which are often curiously veined and capable of taking a good polish, the ash is scarcely used by the cabinet-maker; but to the village carpenter and wheelwright its timber is invaluable on account of its hardness, toughness, and elasticity. It is used for ploughs, harrows, wheels, axle-trees, handles for spades and various implements of agriculture, and it has the advantage of combining strength with lightness. It is also very valuable for blocks, pulleys, and those parts of machinery which have to sustain sudden shocks. Kitchen tables made of ash do not splinter, and they bear scouring well. Milk-pails are formed of it by rolling the plank into a hollow cylinder and putting in a bottom. Ash timber will bear a greater weight without breaking than that of any other of the indigenous forest-trees of Europe. Like the Spanish chestnut, the wood of young trees is most esteemed, as the fibre is stronger and more elastic. An ash-pole three inches in diameter will be as durable as the timber of the largest tree. The best time for felling is said to be when the tree has attained the age of from thirty to sixty years; but it continues to grow for several centuries. A great part of the supply of ash timber is obtained from trees growing in hedge-rows. In some districts it is almost the only tree planted in this way; but the supply from the hedge-rows is every day diminishing, as, notwithstanding the value of the timber, the long straggling roots, which push forth just below the surface, exhaust the soil around, and the tree is sacrificed to the necessity of speedier profits from the annual produce of the ground whose fertility it destroys. The ash is frequently pollarded, and when thus treated it yields a considerable quantity of wood for fuel and minor purposes. Besides its more general use by the carpenter, the ash is valuable in other ways: it makes good potash; the bark is employed in tanning calf-skins and nets; and as fuel it is excellent. Evelyn says that it is the best fuel for smoke-drying herrings.
The ash is indigenous to all the countries of Europe, and is found in northern Africa and many of the northern parts of Asia. There is a great tendency in the ash to run into varieties, many of which assume the character of distinct species, and trees similar in appearance to the ash occur in North America. The most striking variety in England is the weeping-ash, which possesses all the characters of the common ash, except that its branches grow downward. It is often grafted on a lofty stem, and the pendant branches form a natural arbour. This variety is said to have originated accidentally in a field at Glamangly, in Cambridgeshire. At Cowpen, near Morpeth, there are some singularly fine trees of this variety. In a good soil the ash attains a height of fifteen feet in ten years. One of the largest trees in this country, and there is little doubt that it is the largest, stands in Woburn Park, the seat of the Duke of Bedford. Its dimensions, which are given by Mr. Loudon in the ‘Arboretum,’ are as follows:—It is ninety feet high from the ground to the top of its branches, and the stem alone is twenty-eight feet. It is twenty-three feet six inches in circumference on the ground; twenty feet at one foot; and nineteen feet five inches at the ground. The circumference of its branches is one hundred and thirteen feet in diameter, and the measurable timber in the body of the tree is three hundred and forty-three feet; and in the arms and branches, one of which is nine feet in circumference, five hundred and twenty-nine feet, making altogether eight hundred and seventy-two feet of timber. Mr. Loudon mentions instances of several ash-trees which are higher, but none that contain so great a bulk of timber. At Carnock, in Stirlingshire, there is a fine ash, planted in 1596, and consequently two hundred and forty-six years old, which contains six hundred and seventy-nine cubic feet of timber. Evelyn suggests that “every prudent lord of a manor should employ one acre of ground to every twenty acres of other land; since, in as many years, it would be worth more than the land itself.”

The value of land has risen so much since Evelyn’s time, as to render this advice no longer judicious; and iron is also extensively used as a substitute for timber. The subsoil should be dry, and stiff clay-land must be avoided. A coppice of ash may be cut every six or seven years for walking-sticks, hoops, rods for crates, lighter hurdles, and wattled fences, or at twelve or fourteen years for hop-poles. When the plants attain a diameter of from four to six inches, the wood becomes useful for a

As a picturesque tree, the ash is admired for the lightness of its whole appearance. Gilpin says:—“Its branches at first keep close to the trunk, and form acute angles with it; but, as they begin to lengthen, they generally take an easy sweep; and the looseness of the leaves, corresponding with the lightness of the spray, the whole forms an elegant depending foliage.”

He adds:—“Nothing can have a better effect than an old ash hanging from the corner of a window, and bringing off the heaviness of the foliage with its loose pendant branches.” Strutt says:—“It is in mountain scenery that the ash appears to peculiar advantage, waving its slender branches over some precipice, which just affords it soil sufficient for its footing, or springing between crevices of rocks; a happy emblem,” he adds, “of the hardy spirit with which it subdues by force the smallness.” Dr. Lindley, in the ‘Penny Cyclopædia,’ characterizes the ash as “singularly graceful for a European tree, often resembling in its slender stems and thin airy foliage the acacias of tropical regions.” The light green of its leaves contrasts agreeably with trees of a more sombre hue. The ash is not, like the oak, a grand object in extreme old age. It labours under one great disadvantage, which interferes with its character as an ornamental tree; and this is the brief period during which it retains its full foliage. The leaves are late in expanding, and in the north of England, in some years, the tree is not fully in leaf before the last week in June. With the first autumnal frost, however early it may be, the long stalks drop from the tree and disfigure the walks, at a time when all nature besides is still rejoicing in the full beauty of maturity. The leaves of the ash do not often exhibit those fading glories which are so eminently beautiful in many other trees. When nipped by the frost, they shrivel and become of a blackish hue; but if no frost has intervened, the leaves assume a lemon-coloured tinge, and have a most picturesque effect. A tract of country planted extensively with ash-trees has a cold and desolate appearance at a later period in spring and earlier in autumn than where other species prevail.

We shall probably not soon return to the subject of trees, and therefore once more recommend them as parts of our natural history. Everything related to inches at the circumference of the ground. The circumference of its branches is one hundred and thirteen feet in diameter, and the measurable timber in the body of the tree is three hundred and forty-three feet; and in the arms and branches, one of which is nine feet in circumference, five hundred and twenty-nine feet, making altogether eight hundred and seventy-two feet of timber. Mr. Loudon, the author of the ‘Arboretum,’ has conferred a favour on the public by pointing out what the commissioners have done for their instruction. “In addition to the scientific name, the English name is given, the natural order to which the tree and shrub belongs, and the year of its introduction into Britain. Thus, in the case of the sugar-maple, we have the words below painted in white on a black ground:

- Acer saccharinum, L.
- The sugar maple.
- An aceraceous tree.
- A native of North America.
- Introduced in 1763.

“I need not enlarge on the entertainment and instruction that this enlightened and liberal act on the part of the Commissioners of Woods and Forests will afford to the public frequenting these gardens, or even to those who, living remote from the metropolis, can visit them occasionally. Suffice it to say, that it will create a new sense in thousands of persons, and enable them to derive a degree of enjoyment from trees and shrubs which they had no idea of before. It will enable the citizen or extensive proprietor, intending to plant, to make choice of those trees and shrubs which he thinks most ornamental, or most likely to answer his purpose; and thus, by improving the appearance of individual estates, it will contribute to increase the beauty and variety of the woody scenery of the whole country.”

**PLAINS, GEOGRAPHICALLY CONSIDERED.**

All those parts of the dry land which cannot properly be called mountainous are plains, and such compose by far the greater part of the earth’s surface. Thus, for instance, it has been estimated that in South America the plains and mountains cover only 30 to 40 per cent. We are not aware that a similar calculation has been made for other parts of the world, nor are there perhaps materials sufficiently exact for the purpose.

The word plain has but an indefinite meaning of itself, and seems to be rightly understood only when
used in opposition to the word mountains, or when conjoined to the name of some known place, in which case it means the country itself so designated, or the environs of some particular spot. Thus we speak of the cities of the plains, the valleys of the plains, the plains of Lombardy, the plains of Quito, &c.

It was a great error to imagine that by the word plain a perfectly horizontal surface is always understood. In its usual acceptation it means a greater or less extent of country, flat in its general level as compared with a mountainous country. The more perfectly even and horizontal the surface, the better does it deserve to be called a plain, such as the plains of Venezuela and of the lower Orinoco, Mesopotamia, &c. But the surface of the ground may be gently undulating, as the plains, of Paris; or it may be studded with hills, as the plains of the Cassiquiare; or it may be traversed by valleys more or less wide and deep, like that part of France which lies between the Loire and the Garonne; or intersected with deep ravines, as the central plains of Russia, without ceasing to be a plain, being divided into two classes, high and low; but a moment's reflection will show that such denominations can apply rigorously only to the two extremities of a scale of elevation, at the bottom of which would stand, for example, the delta of Egypt or the llanos of South America (which latter are raised above sea-level only about 120 feet above the level of the ocean, and in some places even less), and at the top the plain of Antisana, 13,435 feet above the sea-level; whereas the greater number of plains are found at intermediate heights, as the following will show:—

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<th>Feet above the Ocean</th>
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<td>The plains of Hungary</td>
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<td>The extensive plains on the north of the old continent from the Scheldt to the Yenisei</td>
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<td>Plains of Moscow</td>
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<td>Plains of Lombardy</td>
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<td>Plains of Lithuania</td>
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<td>Suabia</td>
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<td>The plateau of Valdai</td>
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<td>Auvergne</td>
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<td>Switzerland between the Alps and Jura</td>
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<td>Steppes of the Kirghis</td>
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<td>Bavaria</td>
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<td>Plains of the two Castiles</td>
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<td>Myosore</td>
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<td>Table-land of Persia</td>
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<td>&amp;c. &amp;c.</td>
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Though we generally regard those plains which are the least raised above the surface of the ocean as the lowest, it must not be forgotten that round the Caspian and Aral there are plains of many thousand square miles considerably depressed below the sea-level; as is also the case with the plain or valley of the Jordan.

The term plateau has often been given exclusively to elevated plains, but this also is incorrect, inasmuch as by a plateau is sometimes meant a great extent of country considerably raised above the rest of the land, and having its mountains, its plains, and its valleys, as is particularly exemplified in the minor plateau of Albania, and in the great plateau of Central Asia. The latter contains four great chains of mountains, the Alai on the north, the Thian-Chan and the Huen-lun in the interior, and the Himalaya on the south, between which are the vast plains of Dzoungaria, of Tongout, and of Tibet, with their rivers, valleys, and lakes.

Table-land, properly so called, is an elevated plain rising abruptly from the general level of the country, and being, as it were, the broad and horizontal or gently undulating top of an immense mountain, as the Nilgerry district of India. Sometimes there are several such one upon the other, at least one on either side, when they are called platforms or terraces, as those on the eastern slope of the Cordillera of New Mexico.

Some writers regard the words plateau and table-land as merely the French and English names for the same sort of elevation. Humboldt is of opinion that these should be confined to elevations producing a sensible diminution of temperature, and accordingly to such heights only as attain to 1800 or 2400 feet. Some again, as Balbi, give the name of plateau to all high and extensive mountain-tracts.

Generally speaking, the plains of Europe are of middling elevation, the extremes of high and low being principally found in Asia and America. Thus, while the great plains of Central Asia, about Ladak, Tibet, and Katchi, and round Kouskounour, and elsewhere, attain a height similar to those of Quito and Titicaca, or from 9000 to 12,000 feet, the great marshy plains of Siberia along the borders of the Frozen Ocean are very slightly raised above the sea-level, as is also the case with the plains of Bengal, at the extremities of the Ganges, the whole of Mesopotamia, the Tehama of Arabia, &c.

In South America, contrasting with the lofty plains of Quito, of Santa Fé de Bogota, &c., are the llanos and the plains of the Amazon; while in North America the interminable prairies and the low swamps round New Orleans form a striking contrast with the Rocky Mountains and the elevated plains of Mexico.

Of Africa little is known, but there is reason to believe that if the plains of Lower Egypt and part of the Sahara are very low, there may be high plains in the mountainous regions.

Plains differ not only in their elevation, but in the horizontality of their surface and general slope, and in the nature of their soil; which circumstances, together with their geographical position, influence their climate and productions, and give to the most considerable among them a particular character and physiognomy. It may be remarked that the rocky and sandy plains lying almost exclusively in the warm and temperate regions of the old world. The plains of America are generally characterised by their gramineous covering or their vast forests; the Asiatic steppes by a twofold appearance, being in some parts studded with low saline plants, and in others, as in Southern Russia, Siberia, and Turkistan, covered with plants of the families of the Compositae and Leguminosae, while the greater part of the European plains are richly cultivated.

We say such are the general characteristics, for there are plains of similar character and physiognomy in very different and widely separated regions of the world. The high land of the Campos Pareis, for instance, in South America, is very similar in physiognomy to the desert of Gobi in Asia. The Desiertos, near Coquimbo, are of the same character as the Sahara. The Puszta of Hungary resembles the savannas of the New World; and the pampas of Cordova are not unlike some of the Siberian steppes.

Though, as we have said, plains constitute by far the greater portion of the earth’s surface, and are very varied in their appearance, there are nevertheless some which are remarkable not only for their extent, but for the peculiarities which distinguish them; peculiarities derived, no doubt, in part from the circumstances attending their original formation, and which no subsequent causes have been able to obliterate. These remarkable plains are known under the names of deserts, lands, and heaths, steppes, savannas, and prairies, llanos, pampas, and selvas (or
Heaths and Landes of Europe.—From Paris to Moscow and Cazan on the one hand, and to Astrakhan on the other, is one continued plain, comprising the lowlands of Northern France, the Netherlands, the North of Germany, the whole of Prussia, and the greater part of Poland and Russia, as far as the first town on the Don. Here the Naouergiúskiâ ranges on the north, the Toruski, the Irtish, and the Lower Volga, forming a natural boundary to this great plain. The Kirghis Cossacks and Tartars give a peculiar feature and interest to this steppes.

The greater part of what are properly called the steppes form a considerable part of the country known as Independent Tartary, which is inhabited by the nomadic hordes of the Kirghis Cossacks.

The steppes which lie on the north-west of the Caspian, bounded by the sands of the little Elaïk, and the lower course of the Don, and thence to the north and west of the Irtish, is inhabited by the Cossacks of the Black Sea and the Nogay Tartars. The whole of this steppes is characterized as composed of hills of a moving shelly sand, between which are beautiful green pastures, and marshy hollows with reeds and clumps of trees, among which are willows, poplars, and wild olive. There are numerous salt streams and brine-pools, barren patches covered with oil, and in many places tufts of saline plants. The fertility of the hollows seems due to a sheet of water, which, coming from the hilly range called Obstcheï Sirt, a branch of the Ural, flows immediately below the sandy surface, being probably retained by an impervious substratum.

Northward, the Siberian plains have a general slope towards the Frozen Ocean, and are intersected by the great rivers Obi, Yenisei, and Lena; between the lower courses of which extend immense frozen marshes, covered with moss, and interspersed with a few sandy and clayey hills crowned with tufts or clumps of stunted birch and other dwarf shrubs.

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great horde occupy a more mountainous country to the south of the Sarasou.

Besides these great steppes, there are numerous other patches of greater or less extent and similar general character in Central Siberia, reaching from the Ural to the Lena.

Previous to the nominal subjection of the wandering hordes to Russia, that country had lines of fortified posts, erected at no great distance against them, but now that the different hordes of Kirghis acknowledge the supremacy of Russia, and their several chiefs are paid by the Russian government, many of these posts have been abandoned, and open villages are now multiplying along the roads by which the Russian caravans travel towards Kishka and in the direction of the mining districts of the Altai. The inhabitants of these villages, some of which are very large, are the only stationary population of the steps. The wandering tribes are very numerous, and are continually shifting their ground to find food for their numerous cattle, consisting of horses, camels, horned cattle, sheep, and goats. These herds, together with the booty taken in their incursions upon the Calkmuths and other native tribes of the Kirghis, who lead easy and independent lives.

The extent of the steps properly so called, excluding the marshy plains of the north, may be about 1,000,000 square miles.

**Savannas or Prairies.**—The central part of North America, from the Frozen Ocean to the Gulf of Mexico, may be regarded as one continuous plain divided by a low watershed into the north-eastern basin, whose waters flow into the Polar Sea, Hudson's Bay, and, by the great lakes and St. Lawrence, into the Atlantic, and the basin of the Missouri and Mississippi, whose waters fall into the Gulf of Mexico.

This immense tract of country, estimated by Humboldt at 2,430,000 square miles, is extremely varied in climate, in character, and productions; for while the northern portion, which is watered by the Mackenzie, Back's River, the Churchill, and the Saskatchewan, is condemned for the greater part of the year to the horrors of an iron-bound soil and stunted polar vegetation, palms and other tropical trees grow at the extremity of the southern portion. It is this southern basin watered by the mighty Missouri and Mississippi, which with their abundant affluents, that contains those extensive grass-covered tracts, the savannas and prairies. They lie chiefly on the western side of the Mississippi, though along the Illinois river they are found to the extent of 1,200,000 acres, and also in other parts of the basin east of the Mississippi. But the whole of the territory from the right bank of the Mississippi to the mountains is not one continuous savanna, or even an unbroken horizontal plain; for it rises towards the mountains, many of whose spurs are reached by the Missouri, which has eroded their extremities into bluffs. These bluffs form the boundaries of the basins of the great tributary streams, the Platte, the Kansas, the Osage, the Arkansas, &c. Woods are also occasionally met with along the Missouri and its affluents, as also the case above Illinois lake and elsewhere. Across the Platte the savanna is intersected by its tributaries, the South Platte and the North Platte, and along the Missouri, the Missouri and its affluents, as also the case above Illinois lake and elsewhere. The savannas or prairies, as they are also called, are divided by Flint, an American writer, into three kinds:—1. the heathy or bushy, which have springs and are covered with small shrubs, grape-vines, &c., very common in Indiana, Illinois, and Missouri; 2. dry or rolling, generally destitute of water and almost of all vegetation but grass; they are the most common and extensive; the traveller may wander for days in these vast expanse of savannah without seeing a drop of water, and see no object rising above the horizon; 3. the alluvial or wet prairies, the smallest division; they are covered with a rich vegetation of tall rank grass.

The soi is deep, black, friable, and fertile, and abounding in pools without issue, left by the floodings of the rainy season. It is over the second kind chiefly that the bisons wander in herds of from forty thousand to fifty thousand. Stags, or more properly wapitis, are also very numerous; and between the Arkansas and Red rivers there are droves of wild horses. Deer are also numerous; and along the borders of the Missouri, above the Platte, or shallow river, the antelope abounds in herds of several hundreds. In summer wild goats are seen in vast numbers along the Mississippi. Above these prairies, the savannas are succeeded by the wheat and barley fields of the Mandans, an interminable plain without trees or shrubs except in the marshy spots. In various parts, but more especially along the borders of the great plain, and in Arkansas, salt is found.

**Siberian Fowling.**—Shooting after our manner is never practised here. If a peasant sees any one shoot flying, he stands with his mouth open, staring with astonishment, not at the skill of the sportsman, but at his folly in expending so much ammunition, which is exceedingly expensive, on a single bird. He believes, as is really the case, that more skill is required to shoot with his rifle that carries the smallest quantity of powder, and a single ball about the size of a swan-shot, with that extraordinary precision necessary so as not to perforate the fur. In this, perhaps, they excel any people living: if they do shoot, though they prefer to trap even the black-cock, ginottes, and coq de bruyère, they never strike the bird on the wing, but always when it has alighted, or three hundred paces. They snare even the double because, a bird hardly known in England, of which there are periodical flights in Russia and Siberia, and which are in our estimation superior to any sort of game we are acquainted with. When they are caught, they approach the object first on all-fours, and then crawl on their stomachs till they are at a proper distance for firing. They have usually two rest to their rifle, which they fix in the snow or ground when not frozen, and having taken a steady aim, rarely if ever miss. To an Englishman these rice do appear, to be sure, the most extraordinary machines, and few would have the courage to use them. They prove, however, that success depends much more on the skill of the sportsman than the excellence of his arms, which, indeed, we have long since found bad, in as many other countries. We have had with us one of the Lancaster's tube-guns, for which the amateurs would have given more than the prime cost, but more out of curiosity than for use. The common rifle-barrels are made at Tobolsk, are very heavy, and have a very small bore. The grooves are round, instead of being conical, and the ball, which is acquired with it, when forced in and the edges rounded off in ramming down. The lock is large and awkward-looking, the springs on the outside, that of the cock clumsy and not tempered; the whole machine works so slowly that you may see the trigger stop and move on its own, and during the progress of the shot, the cock would not discharge the bush. The charge does not contain fifty grains of powder. In the event of a spring breaking, the chasseur readily replaces it by one of wood, generally of larch, which answers his purpose equally well, and he is thus independent of the gunmaker. With all these imperfections, as we have said before, they rarely or never miss, and always hit an animal whose fur is precious through the muzzle. Rifles of this sort cost here 25 rubles, powder 5 rubles per lb, and lead is also dear. —Cottrell's Recollections of Siberia.
THE VALE OF WYOMING.

The poetical associations with "delightful Wyoming" have given it a celebrity that its otherwise sequestered situation would never have attained, although the historical events which there took place were important enough and terrible enough to attract the attention and interest the feelings of all who might have become acquainted with them. The celebrity given to it by Campbell's beautiful poem may perhaps justify our quoting the historical account of these events as a point of curious comparison. The poem is too well known to need any lengthened quotation, and we shall therefore only present the poet's description of its state, previous to the commencement of its troubles in 1778.

"Delightful Wyoming! beneath thy skies
The happy shepherd swains had nought to do
But feed their flocks on green declivities,
Or skim perchance thy lake with light canoe,
From morn till evening's sweeter pastime grew,
With timbrel, when, beneath the forests brown,
They lovely maidens would the dance renew;
And nay those sunny mountains half-way down
Would echo flageolet from some romantic town.

And scarce had Wyoming of war or crime
Heard, but in Transatlantic story rung;
For here the exile met from every clime,
And spoke in friendship every distant tongue;
Men from the blood of warring Europe sprung
Were but divided by the ruimg brook;
And happy where no Rhenish trumpet sung,
On plains no sieging mine's volcano shook,
The blue-eyed German changed his sword to pruning-hook."

This beautiful poetical picture of a state rivalling the golden age, is severely contradicted by the historian; and it is no slight proof of the poet's art, that, without any violation of the truth of nature, he has been able to elevate such a tissue of crime and cruelty into a poem of such extreme beauty. This he has done chiefly by selecting only a few actors, and thus leaving the baser passions which acted the multitude in obscurity. The historian (we quote from the 'Pictorial History of England') says:

"This naturally beautiful district was dotted with eight new townships, each containing a territory of about five miles on both sides of the river Susquehanna. The climate was genial, the soil luxuriantly fertile, and there was that alteration of hill and valley, wood and water, careful cultivation and natural wildness, which constitutes the most picturesque and lovely of scenery. But this terrestrial paradise had been inhabited all along by unquiet spirits, who had laid the foundations of their establishments in war, and who had been obliged all along to protect them with the sword. Romantic travellers, enchanted with the natural beauty and tranquillity of the spot, fondly fancied a peaceful, happy population, in harmony with the scene. There could not be a greater mistake. The district, in the natural order of things, or by its geographical position, seemed properly to belong to Pennsylvania; but the colony of Connecticut claimed it in virtue of an old grant, and it was first settled and cultivated by a numerous swarm from the populous hive of Connecticut. The Pennsylvanians instantly set up their counter-claim, and referred to maps and their natural boundaries as the best arguments to support it. The Connecticut men, who always held what they got with great tenacity, refused to relinquish possession, and, after many long and angry debates, the two colonies actually went to war with one another about Wyoming. And these hostilities between Pennsylvania and Connecticut were prosecuted with such earnestness, that they lasted even after the breaking out of the war with England, and were only suspended by the near approach of a common danger. Several Pennsylvania families had obtained a settlement in the district; these, like a very large portion of the colony of Pennsylvania, were decided royalists; and it appears that some of the most considerable of the Connecticut settlers entertained the same political principles. But there, as elsewhere, the revolutionary party gained an ascendency which they were incapable of using with moderation. The fiercest of factions and feuds raged through all the townships, converting that little paradise into a very hell. These violent animosities were not confined to particular families or places, or marked by any line of distinction; they crept under every roof; they divided father from son, brother from..."
brother: they made an incessant jar and discord; they poisoned all the sources of domestic happiness, and they converted the denizens of the spot into creatures as fierce and savage as the red Indians, or the wild beasts that had formerly occupied it or prowled over it.

"Such was the real condition of Wyoming, which poets and other writers have described as one of the happiest spots of human existence! The revolutionary party, after oppressing and driving out most of the royalists, sent a large reinforcement to serve in the army of Congress, and thus laid themselves open to attack from the savages and from their expelled brethren. They had built some little forts, but these were unequal to the protection of the district, every step of which was familiar to the exiles; and, as their best men had gone to fight against the British, they had but indifferent garrisons to put into these forts. They had received repeated warnings, but they continued to be obstinately blind to their danger, despising the Tory fugitives, and relying on delusive promises made them by some of the Indian tribes. Early in July they were routed in battle first for blood and then for land. They apprehended the appearance of 800 men on the bank of the Susquehanna. Of this hostile force scarcely more than one-half were real Indians, the rest being Anglo-Americans disguised as Indian warriors. The outrages from Wyoming had been joined by fugitive royalists from other parts of the back settlements. They were reported to be led by the Colonel Zebulon Butler, the same who had offered General Carleton the service of the Indians in Canada, four years before, and by one Brandt, half Mohawk and half American, and (as not uncommon with such hybrids) said to be a man of great cunning and ferocity, with an unquenchable thirst for blood. It appears, however, there are some reasons for doubting whether Brandt was a man of this character, and whether he was engaged at all in the fatal Wyoming incursion. But whoever were the conductors of the expedition, it was conducted with monstrous cruelty, nor could less be expected from such a combination of evil passions and habits. The imagination and the inventive faculties of the Americans were, however, employed in the appalling narratives which were soon afterwards spread through the world; and it is now established by the best authorities, that scarcely a tithe of the horrors that have figured in many books had any foundation in truth. It is also established as an unquestionable fact that months before the invasion into Wyoming, early in the spring, Congress had determined upon carrying the war into the country of the Indians (how mercifully such expeditions were conducted had been proved the preceding year), and that the design of extermination had only been suspended through want of means and the exigencies of war in other quarters.

"On the appearance of the hostile force there were only sixty American regulars in the district, under the command of Colonel Zebulon Butler, said to be of the same family as the Colonel Butler that was leading on the invaders: but the militia, under the command of Colonel Dennison, amounted to some 500 men. The Indians and their allies entered the valley of Wyoming near its northern boundary, and took without resistance one of the forts called Wintemoots, which they burned. This was the first notice of their arrival. The militia and all the inhabitants capable of bearing arms assembled at Forty-fort, a stronger place on the west side of the Susquehanna, and four miles below the city of Philadelphia. Washington sent out some regular troops to the district; but Colonel Zebulon Butler rashly resolved, without waiting for their arrival, to go out from Forty-fort and fight these real and sham Indians. He found them well posted in a plain, partially covered with pine-trees, dwarf oaks, and underwood; and, while he was moving in single column, he was saluted by the fire of Indians from behind bushes and trees. Zebulon Butler, however, formed into line; but a body of Indians turned his left flank, which was composed of the militia, and poured a destructive fire on his rear. Upon this the word 'retreat' was heard, the militia broke, and it was not in the power of Zebulon Butler and his followers to form them again. The sixty regulars were obliged to join in the flight; but they could not take the road by which they had advanced; — the enemy was in front, and on one side was a marsh and a mountain, and on the other the deep river. As soon as their line was broken, the Indians and their equally savage allies threw down their rifles and muskets, and fell upon them with their tomahawks. The massacre became general — the cry for quarter and for mercy was unheeded. Rather less than sixty men escaped by swimming across the river, hiding in the marsh, or climbing the mountain; only three prisoners were taken and preserved alive; and the rest of the force, regulars and militia, officers and men, amounted altogether to nearly four hundred, were butchered on the spot. Colonel Zebulon Butler, who, as a regular officer, ought to have proceeded with more judgment, and Colonel Dennison, the head of the militia, had the good fortune to escape. Butler, understanding that no quarter would be allowed to the troops of Congress, had withdrawn his detachment; — the enemy was in front, — they joined in the flight; but they could not take the road by which they had advanced; and on the back settlements. They were reported to be led by the same family asthe Colonel Butler that was leading on PLAINS, GEOGRAPHICALLY CONSIDERED.

"When, where of yesterday a garden bloom'd, Death overspread his pall, and blackening ashes gloom'd.'

The troops of Congress soon retaliated; the regiments Washington was sending were reinforced by a great many riflemen of Morgan's corps; and the regulars, upon the Indian settlements, destroyed their corn, burned their villages, exterminated all they could surprise, and forced the rest to retire farther from the frontiers of the colonies. The red men who escaped awaited another opportunity for revenge."

PLAINS, GEOGRAPHICALLY CONSIDERED.

(Concluded from page 488.)

LLANO. — The whole interior of South America, from the mountains of Caracas on the north to the Straits of Magalhaens on the south, is divided by comparatively low transverse ridges, running east and west into three great basins; that of the Orinoco on the north, that of the Amazon or Marajo in the centre, and that of the La Plata on the south. The first comprises the llanos, vast plains occupying a surface of 260,000 square miles. They may be divided into two principal portions: the first, beginning at the mouths of the Orinoco, extends westward as far as the Andes of New Granada, being bounded on the north by the Caracas, and on the south by the mountainous group.
soil and the great evaporation, are sufficient to arrest of Parime and the Rio Apure, an affluent of the lower Orinoco. The other portion of the llanos, which is twice as extensive as the first, reaches from the Apure on the north to the Carquetas (an affluent of the Mañay) on the south; having the Andes on the west, and the sierra of Parime and the Orinoco on the east. The inclination of these plains is to the east and south, and they are traversed by many streams, which, taking their rise from the eastern slope of the Andes, bear their tributary waters to the Orinoco. As the medium length of the plains does not exceed two hundred feet, the course of the rivers is very slow and often scarcely perceptible.

The chief characteristic of the llanos, says Humboldt, is the absolute want of hills and inequalities, the perfect level of every part of the soil. Often in the space of two hundred and seventy square miles there is not an eminence of afoot high. This resemblance to the surface of the sea strikes the imagination most powerfully where the plains are altogether destitute of palm-trees, and where the mountains of the shore and of the Orinoco are so distant that they cannot be seen. This unvarying equality of surface reigns without interruption from the mouths of the Orinoco to the Villa de Aurore and Ospinos, under a parallel of five hundred and forty miles in length, and from San Carlos to the Carquetas, under a parallel of six hundred miles.

There are however, notwithstanding this uniformity of surface, two kinds of inequalities in the llanos. The first, called *brancos*, are horizontal banks of sandstone or limestone standing four or five feet higher than the rest of the plain, and sometimes many leagues in length. The second kind of inequality, called *mesas*, consist of convex eminences rising to the height of a few fathoms.

The llanos have different names in different parts: thus, from the Mouth of the Dragon, the llanos of Cumanac, of Barcelona, and of Caracas or Venezuela, follow from east to west, when turning southward from 8° N. lat., between the meridians of 67°40' and 70°40', we find the llanos of Varinas, Casuar, the Meta, Guayavare, Guanac, and Caqueta. All these are again subdivided.

The aspect of the llanos is somewhat dissimilar in different places; but the greatest difference depends upon the seasons. The local dissimilarity arises chiefly from the nature of the palm-trees scattered about, which vary in different places, and also from the greater or less abundance and variety of the dicotyledonous plants which are intermingled with the trees. The height of which latter is also very unequal, being sometimes only a few inches at a distance from the watercourses, and rising to a height of four feet in their vicinity. In this high grass the jaguar, or American tiger, lurks to spring upon the mules and horses that cross the plain. But the season of drought or of rain changes the aspect of the greater part of the llanos. In the rainy season, says Humboldt, the llanos display a beautiful verdure, but in the time of great drought they assume the aspect of a desert. The grass is then reduced to powder, the earth cracks, the alligators and great serpents remain buried in the dried mud, till awakened from their long lethargy by the first rain. These phenomena are observed on barren tracts of fifty or sixty leagues in length where the llanos are not traversed by rivers.

The principal and almost the only trees of the llanos are different varieties of palms. The *Corvpa tectorum*, or Palma de Cobija, solitary or in clumps, rises here and there as a landmark through these trackless plains. It is chiefly found in the llanos of Caracas from Mesa de Peja, as far as Guayaval. Farther north and northwest, near Guayare and San Carlos, its place is taken by another species of the same genus. Other palm trees appear to the south of Guayaval, especially the *Pirita*, with pinnate leaves, and the *Marichi*, whose beautiful verdure, at the period of the greatest drought, contrasts with the mournful aspect of the grey and dusty leaves of the cobija. Two or three other species of trees besides palms are also found in the llanos, and it is round these clumps that the llanos are the most fertile.

The great wealth of the llanos consists in the numerous herds which they feed. The first horned cattle were let loose in these extensive pastures by Christoval Rodriguez, about the year 1542, since when they have increased to almost countless numbers. About ninety-eight thousand head of cattle are said to wander in the pastures round Calaboa. But, according to M. Depons, there are, from the mouths of the Orinoco to the lake of Maracaybo, one million two hundred thousand oxen, one hundred and eighty thousand horses, and ninety thousand mules, the annual produce of which herds is estimated at about five million francs. The richest proprietors are said to mark as many as fourteen thousand head every year, and sell to the number of five or six thousand. According to official documents, prior to the Revolution the exportation of hides from the whole capitania-general amounted annually, from the West India Islands alone, to one hundred and seventy-four thousand skins of different qualities, of goats and as has already been said, to this account no mention is made of fraudulent dealings in hides, it would appear that the number of one million two hundred thousand, stated above, is much underrated.

All the parts of the llanos are not equally favourable for the breeding of mules and oxen; but in some of the plainer places, where snow is not numerous, the pastures are so fertile as to furnish meat of an excellent quality for provisioning the coast.

The horses of the llanos are not very large, but are descended from a fine Spanish breed. Deer are natives of these plains.

The greatest curiosity of the llanos are the yunnamoti, or electrical eels, which live in the pools as well as in the rivers of this part of South America. We may also mention, as distinguishing the llanos from the pampas, and from the plains of North America, the Sahara, and the steppes of Asia, the total absence of any formation of muriate of soda.

Pampas, from an Indian word, which, in the Quichua language, signifies properly a flat, is the name given to extensive plains in the southern and central parts of South America. Those which lie to the south and north-west of Buenos Ayres are called, the former the Pampas of Buenos Ayres, or simply the Pampas, and the latter the Pampas of Cordova. The plains to the south of the province of Chiquitos bear the name of the Pampas de Huancacos. There is also one more to the north, between the river Beni and the river Maracaybo, a tributary of the lower Orinoco, which is called the Pampas de Huanacos. There is also one more to the north, between Huallaga and the Ucayal, there is another, called the Pampas del Sacramento.

The Pampas of Buenos Ayres are bordered on the west by the forests which lie along the base of the Andes of Chile; on the east by the Atlantic; on the south by the Rio Negro and Patagonia, the interior of which, though bleak and inhospitable, is thrown into contrast with the muriate of soda; and on the north-east by the Rio de la Plata. In the direction due north the pampa narrows between the Parana and a ridge coming from the Andes, called the Sierra de Cordova.

This region, reckoning to the foot of the mountains on the west, occupies a surface of about 315,000 square miles. This plain has no general slope, or rather, it slopes so gently towards the east, that the slightest inequalities, together with the absorbing nature of the
the course of the waters; so that, with the exception of the rivers Colorado and Negro, which come from the Cordilleras, and which traverse the southern part of the pampas, and the Salado, a small stream which flows into the Rio de la Plata at its mouth, the pampas have no running waters, but, instead of them, a great many shallow pools, of which the water is often brackish. There is one at about four hundred and fifty miles from Buenos Ayres, in the direction west-south-west, always filled with salt, from which the city of Buenos Ayres was yearly supplied before the port was thrown open to foreigners. The southern part of the pampas is sandy, with patches of saltbush and stunted trees; the northern parts are covered with grass, supplying food to large herds of cattle and wild horses, the descendants of those first introduced by the Spaniards. It is said that several million head of cattle and about half as many horses feed on the Pampas of Buenos Ayres. There are also wild beasts.

This plain is traversed by a road which leads from Buenos Ayres to Chile, along which the traveller meets with huts, which form stations, distant from each other about seven or eight leagues. The journey may be made on horseback or in a carriage, but it is sometimes dangerous, on account of the Indians.

The Pampa of Cordova extends from the right bank of the Lower Parana to the Sierra de Cordova at the west. On the north it joins the sandy plains or travesias of Santa Fe and Salta.

This pampa resembles that already described in all things, excepting being traversed by a greater number of streams. All these streams however, with the exception of the Rio Salado, which falls into the Parana, lose themselves in the sands, or end in marshes and lakes without issue, and which in the country are called lagunas, particularly in the case with the Rio Dulce, which, rising in a fertile valley on the eastern slope of one of the lateral chains of the Andes, passes by S. Miguel de Tucuman and Santiago, and finally empties itself into the lagunas of las Porongos; the same is also the case with Rio Primero, on which is situated Cordova, the best of all the towns of Tucuman, the residence of a bishop, and where the Jesuits had founded a celebrated university.

Throughout the whole of the country between the Parana and the mountains to the west, from Chaco on the north to the extreme southern extremity of the Pampa of Buenos Ayres, says Azara, there is neither river, lake, nor well that is not brackish. Even the Pilcomayo and the Vermejo partake of this saltiness; and the same author assures us that he has seen in lagunas, dried up by the heat, a layer of Epsom salts above three inches in thickness.

The inhabitants of the fertile valleys lying to the west and north of the plains of Tucuman, similar in some respects to Little Baviaria, rich in their rocks, without ambition, and without care, close the day in rural amusement, by being sung by Theocritus and Statius. It is nevertheless more fertile than the travesias; and the spaces of many square leagues in extent condemned to absolute sterility. The traveller may pass for days together over sands and stones, between which there spring up here and there some saline plants, without meeting with any other objects than a few isolated huts on the borders of some brackish stream: these barren districts are generally designated by the term travesias.

Pampa of Huancacos.—Leaving the Pampa of Cordova on the south, and travelling through forests swarming with bees, which extend beyond the Rio Dulce and the Salado, we enter on the territory of the Abipones, a race of very warlike Indians; after which, crossing the Rio Vermejo, we gain the plains of the Gran Chaco, occupied by more or less savage indigenous tribes. This region is traversed by the Rio Pilcomayo, which, passing near the mines of Potosi, falls into the Paraguay below the city of Assumption. To the north lies the Pampa de Huanacos, adjoining the province of Chiquitos, bounded on the east by the great Laguna of Xarayes, through which passes the frontier of Brazil; on the west by the heights of Santa Cruz de Sierra, and on the north by the forests of the province of Moços and the sandy plateau called Campos Parexis.

Pampa de Moços is on the north of the province of Moços, between the rivers Beni and Marmoré; and between the junction of this latter and the Guapore, other sources of the Madeira, are other pampas of considerable extent.

Pampa del Sacramento.—This pampa is situated on the north-west of Cuzeo. It differs from the other pampas in having a more tropical vegetation, and in its soil not being saline. It occupies a surface of from 54,000 to 63,000 square miles.

Such are the principal pampas of South America; and, if we include a part of Patagonia as being of the same nature with the pampas, we shall have, without reckoning the pampas of Moços and Sacramento, and a number of spots of similar character but less extent, an almost uninterrupted band, extending from the Campos Parexis, in latitude 15° S., to the bay of St. George in 45°, or about 2900 geographical miles long and 300 wide, or a surface of 840,000 square miles: this is to be reckoned with the plains of South America, particularly of the north-west of Cuzco, between the rivers Beni and Marmoré, and the Guapore, the principal sources of the Madeira, which will add another to the picturesque attractions of Corsica. This is a grotto of stalactites. "It would be difficult," says the writer, "to find anywhere else, in a space so small (though the grotto is nearly seventy-five metres in length, by eight to ten in width), points of view more numerous, or forms more varied, Pilasters, columns, great and small, capi-

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The sudden success of Bolingbroke's attempt on the crown of the king who had banished him would be inexplicable, if we looked merely on his talents, ambition, and wrongs on the one side, and Richard's weakness and vacillation on the other; it was the state of England at the period in question that really determined the whole matter. When the people were accustomed to talk, as Froissart says they were, in the following extract, we can perceive how easily success might be insured in the boldest attempts at change, by those properly qualified. The historian is referring to the period immediately preceding that memorable visit of the king to Ireland, from which he was to be recalled by such startling intelligence. "The state generally of all men in England began to murmur, and to rise one against another, and ministering of justice was clean stopped up in all courts of England; whereof the valiant men and prelates, who loved rest and peace, and were glad to pay their duties, were greatly abashed: for there rose in the realm companies in divers routs, keeping the field and highways, so that merchants durst not ride abroad to exercise their merchandise for doubt of robbing; and no man knew to whom to complain to do them right, reason, and justice, which things were right prejudicial and displeasant to the good people of England, for it was contrary to their accustomed usage: for all people, labourers and merchants, in England were wont to live in rest and peace, and to occupy their merchandise peaceably, and the labourers to labour their land quietly; and then it was contrary, for when merchants rode from town to town with their merchandise, and had either gold or
silver in their purses, it was taken from them; and from other men and labourers out of their houses these companions would take wheat, oats, beets, muttons, porks, and the poor men durst speak no word. These evil deeds daily multiplied, so that great complaints and lamentations were made thereof throughout the realm, and the good people said, 'The time is changed upon us from good to evil, ever since the death of good King Edward III., in whose days justice was well kept and ministered. In his days there was no man so hardy in England to take a hen or a chicken, or a sheep, without he had paid truly for it; and now—days, all that we have is taken from us, and yet we dare not speak: these things cannot long endure; but that England is likely to be lost without recovery. We have a King now that will do nothing: he intendment, but to idleness, and to accomplish his pleasure, and by that he showeth he careth not how everything goeth, so he may have his will. It were time to provide for remedy, or else our enemies will rejoice and mock us.' That remedy, no doubt, their favourite Henry of Lancaster appeared to them in the west, from where the rumour circulated through the length and breadth of the land that he was returned from his banishment, indignant at the most unjust seizure of his family possessions, the death of his father, a few months before, and determined upon redress.

The principal events—with all their minute details—of this deeply interesting history, are so well known, that we shall merely refer to them in passing: such as Bolingbroke's rapid march to London, where he appeared in an incredibly short space of time after the first news of his landing at Ravenspur, and with an army of 60,000 men; the drawing over to his interests of his and the king's uncle, the Duke of York, who had been sent by Richard to apply to the king the march towards the coast to meet the unfortunate Richard almost at his very landing; the landing at Milford Haven and the desertion of the king by most of his troops; his surrender to the Earl of Northumberland at Flint Castle, and the meeting at the same place with Bolingbroke; the journey together to London, the freedom of the city of London, the meeting in the Tower. This over, one relief was allowed to him—he was permitted to retire to his prison solitude, and feel that whatever fate might yet await him, his sorrows and misfortunes were no longer to be a public show; he was spared from personally participating in what yet remained of Bolingbroke's triumph, the public announcement of his accession to the throne, and all the pomp and bustle of the coronation.

It was, says Froissart, "in the year of our Lord 1399, the last day of September, on a Tuesday, began a parliament at Westminster, held by Henry, duke of Lancaster, at which time there was assembled prelates and clergy of the realm of England, a great number, and also dukes, earls, and barons, and of every town a certain representative or representatives. Thus, the people assembled at Westminster, there being present the Duke of Lancaster; and there the same Duke challenged the realm of England, and desired to be king by three reasons:—first, by conquest; secondly, because he was heir; and thirdly, because Richard of Bourdeaux had resigned the realm into his hands by his free will, in the presence of certain dukes, earls, prelates, and barons, in the hall within the Tower of London. These three causes showed, the Duke of Lancaster required all the people there present, as well one as other, to show their minds and interests in that behalf. Then all the people with one voice said, 'That that was done was done because he had a sword of state, and he have none other but him.' Then the Duke again said to the people, 'Sirs, is this your mind?' and they all with one voice said, 'Yea! Yea!' And then the Duke sat down in the siege (seat) royal, which seat was raised up in the hall, and covered with a cloth of estate, so that every man might well see him sit. And then the people lifted up their hands on high, promising him their faith and allegiance. Then the parliament concluded." It appears from other authorities, that in the course of the proceedings this day certain articles of impeachment, thirty-three in number, were read, and Richard declared guilty of them all; one voice alone, it is said, being raised in his favour, that of Thomas Merks, bishop of Carlisle, whose reward was an arrest at the close of his speech, and a committal as prisoner to the Abbey of St. Alban's.

The day chosen for the coronation was "St. Edward's day, Monday, the 13th day of October; at which time, the Saturday before his coronation, he departed from Westminster, and rode to the Tower of London with a great number; and that night all such esquires as should be made knights the next day watched, who were to the number of forty-six; every squire had his baine (bath) by himself; and the next day the Duke rode through London with a great number of lords, every lord's servant in the city, the streets (were) hanged with menever, like prelates, with white laces hanging on their shoulders. And after dinner the duke departed from the Tower to Westminster, and rode all the way bareheaded, and about his neck the livery of France. He was accompanied with the prince, his sons, and six dukes, six earls, and a thousand horse; and the prelates and clergymen came from Westminster church in procession, and all the lords and barons served, and rode with the Duke of Lancaster, and the king's uncle, the Duke of York, who was the king's servant, and the Duke of Cornwall, who was the king's son, and the Earl of Northumberland his uncle, who was the king's son, and the Duke of York, who was the king's son, and the Earl of Northumberland his uncle, who was the king's son.

Then the king had on a short coat of cloth of gold, after the manner of Almaine, and he was mounted on a white coursier, and the garter on his left leg. Thus the duke rode through London with a great number of lords, every lord's servant in his master's livery. All the gilds and merceresses and his household served, and every craft with their livery and device. Thus he was conveyed to Westminster. He was in number a six thousand horse; and the streets (were) hanged as he passed by; and the same day and the next there were in London running seven conduits with wine, white and red. That night the duke was bained (bathed), and the next morning he was confessed, and heard the right of carrying the canopy at the coronation. Note by Editor of last edition of Lord Berner's Translation.
said 'Yea!' and held up their hands, promising faith and obedience. Then the king rose and went down to the high altar to be sacred (consecrated), at which consecration there were two archbishops and bishops, and before the altar there he was despoiled out of all his vestures of estate, and there he was anointed in six places—on the head, the breast, and on the two shoulders behind, and on the hands; then a bonnet was set on his head. And while he was anointing, the clergy sang the Liturgy and such service as they sing at the hallowing of the font. Then the king was appraised like a prelate of the church, with a cope of red silk, and a pair of spurs with a point without a rowel; then the sword of justice was drawn out of the sheath and hallowed, and then it was taken to the king, who did put it again into the sheath; then the archbishop of Canterbury did gird the sword about him; then St. Edward's crown was brought forth (which is close above) and blessed; and then the archbishop did set it on the king's head. After mass the king departed out of the church in the same estate, and went to his palace, and there was a fountain that ran by divers branches white wine and red. Then the king entered into the hall, and so into a privy chamber, and after came out again to dinner."

But it has all the appearance of Richard's history is the mystery which envelopes its termination. In the month following the coronation, the House of Lords, in answer to the new king's request, that they would consider what should be done with his captive predecessor, advised his close confinement in some castle, the knowledge of which should be kept secret. Richard was in consequence removed privately from London a few days after, and to another invented by Mr. Bate. Many conflicting statements were made in reference to the comparative excellence of the two methods, or rather, of the fact that two methods were used in practice; and these came under the notice of parliament about five or six years ago, in relation to a subject of national interest.

It is known that the British Museum contains a very valuable collection of coins, which, if brought more within the cognizance of the public, might usefully illustrate the history of the times and reigns during which the coins and medals were struck. To aid in this object, it had often been proposed to engrave these coins, the size, device, and general appearance of each coin being represented as accurately as possible by the process known as a "Tracer," or the "Etcher." But it would not pay as a private speculation; and hence attention began to be paid to the question, whether or not the government would assist in this object. Accordingly a London publisher petitioned the House of Commons, praying for assistance towards the publication of a work on the subject of a 'Medallic Illustration of British History,' the plates for which were to be engraved by a machine invented by M. Collas, a French artist, and worked by a firm to whom the patent in that invention belonged. Two works, one relating to the Great Seals of England, and the other bearing the title of the 'Tresor Numismatique,' had been produced by this process; and the same was proposed to be adopted in the projected work. A Committee of the House of Commons, employed in collecting evidence relating to the British Museum, had its attention drawn both to this process and to another invented by Mr. Bate. Many conflicting statements were made in reference to the comparative excellence of the two methods, as is generally the case under such circumstances; but we shall be able to describe the methods without entering into the discussion.

It may assist in conveying a notion of medal-engraving if we first allude to the 'silhouette' or profile machine. Here the person whose profile is to be taken sits in a convenient position in a chair; and the long arm of a slender rod or lever, extending right and left with respect to the sitter, passes down the prominent features of the face, touching the forehead, nose, lips, and chin, in succession. A fulcrum or pivot is situated near the outer end of the rod, in which it turns; whence it is easy to see that the end of the smaller section of the rod must describe a line precisely similar to that of the larger, but smaller and inverted. A sheet of paper is so placed that a pencil, attached to the small arm, shall trace a line similar to the profile line of the face, and thereby furnishing the first element for a profile portrait. We may for convenience call the longer arm the 'tracer,' and the shorter the 'etcher.'

Now in the process of medal-engraving by a machine there is a tracer and also an etcher, so connected by a fulcrum or pivot, that every movement of the etcher is governed by that of the tracer. Beyond this point the analogy ceases. Suppose the coin to be having a device in bold relief on the surface which is to be copied. The coin is laid down flat with the de-
vice uppermost; and near it is placed the plate of copper in which the engraving is to be effected, the copper being in a vertical position. A peculiar bent lever is so arranged over the coin, that while a horizontal arm, springing from the fulcrum, touches the copper plate, another and vertical arm descends to the surface of the coin. The tracer-point of this lever is simply a fine metallic point, while the etching-point is a diamond or some other hard substance capable of easily cutting into the surface of the copper, or rather, into an etching-ground laid on the copper: the adjustment is such that every movement of the coin is accompanied by a movement of the copper plate, without disturbing the angle which the one bears to the other.

Such being the arrangement, let us suppose the tracer point to pass over a flat or level portion of the coin, and in a line parallel with the copper plate. The diamond-denther would in such case evidently draw a straight horizontal line on the copper plate, which might then be deemed the representative of the line marked out by the tracer. But let the tracer point over an elevated portion of the upper part of the coin, such as the head on a coin; and what would then result? As the tracer is vertical, and its point touches the coin, it must evidently rise and fall according as it passes over projections and hollows in the device, the greatest height being attained when the point is resting on the highest part of the relief. This rise and fall in the level of the tracer produces a corresponding movement in the etcher, so that the latter, instead of describing a straight horizontal line on the copper plate, describes a curved line, the boldness of the curvature corresponding exactly with the boldness of the relief in the coin; the line is in fact a representation of the section of the surface of the coin at the part where the tracer touches it.

By a succession of such lines as are here alluded to, a multitude of sections of the coin become represented on the copper plate. An adjustment of the machine causes the tracer to pass over nearly every part of the surface of the coin in parallel lines, the point of the tracer rising and falling wherever an elevation or a depression occurs, and sinking in the opposite case. The connection between the tracer and the etcher necessarily leads to this result, that an equal number of lines become marked on the copper plate. But it may now be asked, how these lines appear; what device do they put on? If the coin were merely a piece of blank metal, the tracer would probably describe a series of uniform parallel lines, without device, without light and shadow, without any semblance of a picture. But the lines are irregularly separated; they are sometimes so closely congregated as to present almost a mass of black; while in other parts they are so wide apart as to leave nearly a white space; and in others, all intermediate degrees are presented. The higher or bolder the device on a medal or coin, the more striking is the contrast between the light which falls on its different parts, and the more unequal the width of the lines in the copper plate—the only element to which the appearance of relief in the engraving is due.

Such is the principle on which the old medal-engraving machines acted, before the introduction of improvements calculated to remove certain inaccuracies in the method. It is quite true that the varying distances of the lines give an appearance of relief to the engraving; but unless the light parts in the engraving exactly correspond in position with the light parts in the medal, the engraving must appear distorted. Such was the case with the old machines; a feature always appeared too long or too broad, too thin, or too thick, according to the mode of adjustment of the machine: the nose was in some instances driven down towards the chin; in others driven upwards towards the forehead; and the stronger the relief in the coin or medal, the greater the amount of this distortion, a distortion which was inseparable from the old construction of the machine.

To remove or lessen this distortion was the object of both the parties before named, who independently entered upon the subject about a dozen years ago. Mr. Bates succeeded in effecting an alteration in the principle of the machine, by which the distortion was wholly removed; the change being a very ingenious application of a mathematical relation between certain lines. In this new form of the machine, the tracer, instead of passing over the coin in a vertical position, that is, at right angles to the base of the coin, inclines at an angle of 45°, midway between the horizontal and the vertical direction, so that the lines marked on the copper are somewhat different in their curvatures and arrangement from those produced when the tracer is held in a vertical position. The remarkable effect of this change is, that the light and dark portions become distributed on the coin, whereby the semblance of relief is given to the former without that distortion of the device which followed from the use of the old machine. If the angle at which the tracer is fixed were made 30° or 60°, or any other than 45°, it is capable of demonstration (though it cannot be well shown here) that the same evil would exist as in the old machine, but in a different degree.

In the Parliamentary Committee before alluded to, Mr. Brockedon, after explaining the action of the different machines, gave an instance to show how rapidly this style of engraving can be executed. Producing an engraving of a medal, executed by Mr. Bates's machine, he remarked:—"This large medal of Henry IV., about four inches in diameter, was begun last evening at four o'clock, and finished at two o'clock this morning, that is, finished in the tracing upon the etching-ground: it then went into the hands of an inferior artist, who bit the lines traced through the copper, and completed it in the same manner as if an artist had superintended it, it would have united all the beauties of such a work of art." Some of the London newspapers have, within the last few years, given to their subscribers copies of the medallion engraving, generally portraits of sovereigns and other noted personages. If the reader has an opportunity of inspecting the detail of these, he will better understand many of the above details. It will be seen that each line is continuous from one edge of the plate to the other; straight in some parts, and curved in others, but unbroken in all. This makes the regular and steady progress of the tracing-point over the medallion from which the engraving was taken, yielding to the hollows and depressions wherever they occurred. If any light or dark part of the engraving be closely examined, it will be seen how this lightness or tint results from a wider separation of the lines at that particular part,—often by a singularly tortuous direction assumed by the lines; but though tortuous, they are not broken; the lines still exist, though unusually separated at this spot. If in a similar manner we inspect the details of the engraving at a darkly-shaded part, or a part which looks like a depressed cavity, we shall see that the lines, without being broken, are grouped closely together. This, so far as darkness of tint being produced by many lines close together, is no more than occurs in common line-engravings; but in the case before us, the lines extend across the engravings which illustrates the nature of this peculiar branch of the fine arts.
IRISH SKETCHES.—No. IV.

WATER-CARRIERS.

It is difficult to estimate all we have lost to the picturesque by the introduction of a New River or a West Middlesex Water Company—the graceful forms which haunted the approach to every spring or conduit—graceful always, as the act of carrying any vessel on the head compels a strict regard to the motion, and renders it "sober, steadfast, and demure." The groups scattered round waiting each its turn, talking over the news of the district,—the failings or misfortunes, the joys or sorrows of their neighbours and friends—the old to recall the past—the young to speculate on the future—the grandmother to look after her grandchildren, each with a vessel proportioned to its powers—the child to tend the steps of its blind grandfather—the lover accidentally calling to drink at the moment his mistress has been led to the spot in her care for the good of others—where the dogs and children of the neighbourhood, having been to drink, remain to play—all combine to render the spot the most attractive in its locality.

In Ireland this innovation on the picturesque has by no means become universal, and consequently the well or the burn has still its attractive groups of young and old carrying, in vessels of every shape and material, this great indispensable, and where the wildness of the dress gives the frequent beauty of such spots its full effect and animation.

The group at the head of this notice was a portion of a party so occupied in the neighbourhood of Cork—the scene was further enlivened by parties of women engaged in washing and beating linen in the stream, while others were drying it on the spot or carrying it off on their heads to a more convenient place for the same purpose.

ON MODEL-MAPPING OR RELIEF-MAPS.

It is familiarly known to those who are in the habit of consulting the best maps, that an attempt is there made to represent inequalities in the level of the ground by peculiar modes of introducing engraved lines. A range of mountains, for instance, is represented by leaving white or nearly white the parts wherein light may be supposed to fall; and throwing into dark shadow, by a thick congregation of lines, the spot...
which may represent the opposite declivity of the range. This is commonly done to a certain extent in all such cases, except those of a very inferior kind; and in maps of high character, such as those resulting from the Ordnance Surveys of England and Ireland, an endeavour is made to represent the greater or less degrees of elevation by a greater or less depth of shadow.

But all such attempts fail to convey vividly to the mind a correct idea of the inequalities of level exhibited by the country mapped out; and when the map is to be used as the basis of engineering operations, such as those in which the level of streams and lakes is concerned, the defect becomes of greater importance. Hence have originated various plans, attended with more or less success, having for their object the representation of districts in relief, by constructing copies which occupy a medium place between ground and models; but all such attempts fail to convey vividly to the mind a correct idea of the inequalities of level exhibited by the country mapped out; and when the map is to be used as the basis of engineering operations, such as those in which the level of streams and lakes is concerned, the defect becomes of greater importance.

The representation of objects in which the height bears a notable proportion to the horizontal extent has been of old effected by different methods; but the raised representation of a district which, however diversified in level whenever viewed by the eye, bears in elevation but a small ratio to its extent, has not been brought prominently into notice until recently. Military engineers have been in the habit of constructing models of celebrated fortresses, mountain forts, and other fortified forts, with a view of illustrating, more clearly than can be effected by maps, the general bearing of the various operations connected with military proceedings. For instance, whoever has visited the United Service Museum, in Whitehall Place, may have seen a model of part of the Island of St. Vincent, with the fortifications erected on it; and another, as near life size as is consistent with its nature, of the citadel of Lisbon, designed by the famous engineer, Count Tello. Another object is to be seen in a loaf of bread, from which the model-map is intended to show not only the undulations of the ground, but all the houses, buildings, woods, hedges, and hollows, by appropriate elevations and cavities; every portion of land being represented, so that when coloured it may indicate the state of husbandry at that spot. In such a map the relative elevations of the ground can be represented, together with the horizontal plane at a given distance above the model, and letting fall perpendiculars from that plane to the model, the perpendiculars will be longer or shorter according as the surface is more or less depressed, and may be compared with a scale in such a manner as to give the relative elevations of the different parts.

The importance of model-mapping, hitherto confined principally to military matters, is now beginning to attract attention. In reference to irrigation, it would be found useful, not only to show not only the undulations of the ground, but all the houses, buildings, woods, hedges, and hollows, by appropriate elevations and cavities; every portion of land being represented, so that when coloured it may indicate the state of husbandry at that spot. In such a map the relative elevations of the ground can be represented, together with the horizontal plane at a given distance above the model, and letting fall perpendiculars from that plane to the model, the perpendiculars will be longer or shorter according as the surface is more or less depressed, and may be compared with a scale in such a manner as to give the relative elevations of the different parts.

THE PENNY MAGAZINE.
or else a die is made, which is stamped on some plastic material (for we are speaking rather of the general principles of such productions, than of any one particular method).

The spread of the use of relief-maps or model-maps will thus be a good deal dependent on the employment of such material for the cast and impression. Within the last few years a new material has come extensively into use in architectural decorations, which seems calculated to be very valuable in this respect, and which indeed has, we believe, already been used for that purpose; we mean papier-maché. Everybody is now familiar with the beautiful examples of embossed drawing-board, card-board, and pasteboard which afford a surface upon which paper and pasteboard will receive impressions from a die or stamp; but the use of odd fragments of coarse paper for a similar purpose—or rather, for the formation of coarser and stouter devices—is not so generally known. Boyle in the last century made use of a remark which shows that a substance analogous to papier-maché was known in his day, as trial has since confirmed us, be made of it. The name applied to this material would seem to indicate that it is of French origin; but in an article in the Encyclopédie Méthodique, written about half a century ago, the material is referred to as in use in England, thus—"The English make in pasteboard ornaments which we make in plaster; they are more durable; they become brittle, and when loosened, the danger is slight and the expense of repair small." It was in architectural decoration that "papier-maché," or carton-pierre (stone-pasteboard) was first extensively introduced. The interior ornaments of buildings in the Elizabethan style were formerly modelled by hand, in moist plaster laid upon the walls and ceiling. "As the moisture is on the spot," it has been observed, "and with much rapidity of execution, in order to prevent the stucco from setting before it had acquired the intended form, the art was somewhat difficult; the workman had to design almost as he worked; therefore, to do it well, it was necessary that he should have some of the acquirements and qualities of an artist. This circumstance of there being much very much to limit the number of workmen, and their pay became proportionably large. It was a unnatural consequence that artisans thus circumstance supposed a consequence that belonged not to their humble work in life: it is said that they might have been seen coming to their work girt with swords, and having their wrists adorned with lace ruffles. This state of the art affected the tone on the part of the workman than was consistent with the rapid execution of work; and the method of modelling gradually gave way to the use of ornaments cast in plaster. This, in its turn, is now giving way to the use of papier-maché, which is only one-sixth as heavy as plaster, and is much less fragile than stone, marble, or wood.

Papier-maché is made of pasteboard and paper prepared in various ways so as to assume the state of a pulp or paste, which is pressed into the moulds or dies destined to give the device. Great improvements have been recently made in the preparation of the material, so as to combine the qualities of toughness and fineness; and the decorations in various parts of the Queen's palace, King's College, the British Museum, the Pantheon, the House of Lords, and many of the club-houses, show how well it has been brought to bear upon architectural design by Mr. Bielefeld. How far it has been or is now being used in the model-mapping process, inventors have not in general stated; but Major Mitchell, when he presented, two or three years ago, a model of his work to the United Service Museum, made a remark which shows one application of the substance in connection with models. In a letter to one of the vice-presidents he said (we quote from the United Service Journal)—"I beg that no cast may be taken from the model, as this might affect my copyright to those already made in copper and papier-maché.

We may remark, as a curious instance of the connection between model-mapping and medal-engraving (the latter of which subjects was briefly noticed in a recent article), that Major Mitchell's model-map has been engraved by Mr. Bate's machine; so that the hilly districts of the Pyrenees are not only represented by protuberances on the map, but also by the peculiar shape, of the relief-like; he says that "the Anaglyptograph"—the somewhat complex name given by Mr. Bate to his machine.

Summer-time of the Swiss herdsmen.—The real life of the chalet is at all times one of labour and hardship; nor must we consider for those of us who have read the biographies of our forefathers, or the legends of our ancestors, that as they may be called, that are within the common reach of travellers. In the higher stations, which are not accessible to females, the men, as may be imagined, are altogether wild in their appearance and habits. They live in the most disgusting dirt, amidst stench, and vermin; they are as brave as wild beasts, and when loose they are as savage as wild beasts. It was in architec-

...
HONG-KONG.

This island has now become an integral part of the British empire, and likely to become also the chief seat of a most important and extensive commerce, destined perhaps to unite in amicable intercourse the three hundred and sixty millions of the hitherto isolated, though certainly not uncivilized Chinese, with the more active and enterprising inhabitants of what we are accustomed to call the civilized world. Peaceful but independent relations with such a country cannot but be productive of reciprocal benefit to all parties, and will, we hope, be henceforward maintained. Our purpose now, however, is to give a short account of the present state of an island in which commerce with its attendant population will probably speedily work extensive alterations.

Hong-Kong is one of a group of rocky islands at the extreme eastern boundary of the estuary of the Choo-kiang or Canton river, and of these it is the most northerly, and nearest to the continent, from which it is divided by a strait varying in breadth from one mile to six. It is situated in lat. 22° 17' N. and long. 114° 12' E., about forty miles east from Macao, and about a hundred miles from Canton. It is about eight miles long, and, according to Dr. M'Pherson, two and a half in breadth at its widest part, while K. S. Mackenzie and Captain J. Elliott Bingham speak of its being five miles broad. The island is rocky, and of a forbidding appearance at a distance, but on a nearer examination there are found many rich and fertile portions interspersed, and it is abundantly supplied with good water; indeed its name is a corruption of the Chinese words Hong-Keang, the red torrent, so called from the colour of the soil through which a stream flows, forming a fine cascade from a cliff adjacent to the harbour, into which it flows, affording great facility to ships taking in fresh water.

The number of native inhabitants is variously stated at from one thousand to seven thousand five hundred, but all the recent writers concur in stating the great influx of inhabitants since our possession of it, and one, Captain Bingham, estimates the present number at fifteen thousand.

The most distinguished advantage of this island is its magnificent harbour. Dr. M'Pherson says of it, "The bay of Hong-Kong cannot probably be surpassed by any in the world, not only by reason of the infinite number of ships which it can accommodate, but also of its safe anchorage from typhoons compared with any harbour in China, and the depth of water close to the land, which along the greater part of the bay is sufficient for a seventy-four to float at a distance of a cable's length from shore. From this circumstance alone the island must prove a possession of enormous value as a commercial acquisition. Magnificent granite-quarries are found all over the island, so that warehouses on any scale can be built close to the water's edge, and wharfs with ease thrown out, which will enable ships to approach for the purpose of loading and unloading. There is at all seasons an abundant supply of fresh water procurable on the island."

In other respects this new colony possesses but few advantages. Its northern side is formed by a connected ridge of mountains, the highest of which is about two thousand feet above the level of the sea. Except in a few spots, these mountains are barren and uncultivated, formed by black projecting masses of granite,
the intervals giving shelter to herbage and brushwood.

There are no trees of any size, and, unlike the gene-

rality of mountainous districts, it possesses but a few

valleys, and these not of any extent. The mountain-

ous, for the most part, fall perpendicularly into the sea,

thus leaving but little space for building at their base.

The interior and south side is chiefly formed by level

and undulating land, and appears to be far better

adapted for private residences than on the north side.

Here the narrow line begins, the chief of which are Ty-tan and Chick-pie-wan. At the former

place a military post has been established. The latter

place, which is about five miles from Ty-tan, forms a

very convenient and well-sheltered site for building

dockyards, &c. Partridge, quail, and snake have been

found on the island, and in the jungle pleasants and

deer have been seen...... A peninsula of considerable

size, with only a few Chinese hamlets upon it, ex-

tends from the town of Cowloon in a south-easterly direc-

tion. This mostly consists of rich level ground. ...... The

appearance of Hong-Kong is anything but pre-

possessing; and to those who have hitherto resided

upon it the climate has proved far from salubrious.

The sea is formed of rank vegetation wet by the

rain, the ground on which, after a heavy rain, be-

comes elastic and boggy. On the Cowloon side of the

bay the atmosphere is at all times more pure, and the

change of temperature less sudden; indeed altogether

it appears a far more likely and preferable spot to form

a settlement than on the Hong-Kong side.*

The climate does not indeed appear to be the only
detriment to the prosperity of the island, but the hope,
hoped, may be found to be ameliorated by local situation on a more

intimate knowledge of the island; while from the

typhoon, the other fearful and more terrific visitant,
increased security will probably be obtained by im-

provements in the harbour through the resources of

British engineering art, and on the land from erect-

ing buildings of greater strength and solidity. Dr.

M’Pherson arrived at Hong-Kong in February, 1841, and he thus writes of the two evils above mentioned:—

"The climate of Hong-Kong at this period was

most variable, the thermometer ranging frequently

10°, 15°, and at times 20°, in the twenty-four hours.

The troops were cantoned on the brow of a high hill, from whence cold blasts of wind and heavy falls of

rain were in quick succession followed by a burning-

haze. The slightest abrasion speedily degenerated into a foul, malignant ulcer; wounds received in action at Cheumpee and elsewhere, but which had already

been cicatrized for days and days, now again broke out. Many poor fellows, proud of their wounds, and everything before them. The houses had all been de-

stroyed, and no covering remained to protect from the

drenching rain continued unabated, and torrents,

several of loose stone would become separated from the mountains, and roll down the hill like a huge

avalanche, threatening destruction to all below. The

last days of Hong-Kong seemed approaching. It was

a grand but truly awful sight.

It will be easier than to describe the helpless and wretched condition in which the inhabi-

tants of this newly-colonized island spent this night.
described, swept away all that escaped the gale of the 21st. It destroyed the temporary buildings thrown up, and exposed the wretched inmates a second time to the fury of a dreadful tempest of wind and rain. The losses sustained, both in life and property, by these typhoons, have been fearful. The country is also exposed to the ravages of the atmosphere some hours in advance of their coming on; evidently indicated the approach of a storm; and the native population, who are generally pretty correct in their indications of the weather, foretold, as did also the barometer, on both occasions, that a typhoon might be expected."

Our engraving represents a spot in the island of New Guinea, which was discovered early in the last century, and now forms an important military post, built in 1740. The town of New Valencia, which is situated in the last century, mentions the founding of the town of New Valencia in 1555, at a distance of half a mile from this lake; whereas Humboldt found it in 1800 to be more than three miles distant. That the water of the lake had really receded many proofs appeared on investigation. Certain rising grounds, in what was originally built on the margin of the lake, and possess the advantage of watering other parts, which without it would have been sterile and barren. At first sight it appears like a slight bridge thrown across the defile.

THE EFFECTS OF FOREST-CLEARING ON LAKES AND STREAMS.

M. Boussingault, an eminent French naturalist and traveller, drew attention a few years ago to the remarkable effect which the clearing of a forest exerts on the lakes and running streams of a district. In the most cultivated and civilized countries of Europe, the clearing was effected so many ages back, that we have no means of comparing present with past appearances; but in America, where the march of man through the trackless forest is so rapid and so irresistible, the facts and appearances presented might be particularly valuable, if the "go-a-head" progress allowed time for their collection.

It is remarked by M. Boussingault, that an opinion prevails that in those regions where the process of clearing has been extensively carried on, less rain falls than formerly. In some cases the streams which were formerly copious, now no longer have water sensibly diminished; in other places rivers seem to have become more shallow, apparently by the disappearance of a portion of their waters, since the pebbly beds have come more and more into sight. Such observations have been principally made in valleys surrounded by mountains; and it has appeared to many that these changes have been on account of the cutting down of large masses of forest. In order to test this matter, M. Boussingault collected much information while residing and travelling in America, and the sum of his details seems to support the general opinion. He selected lakes as the assemblages of water most suited for his observations, since they may be considered as natural gauges calculated to assist in valuing the variations which may take place in the quantities of water fertilizing a given extent of country. If the volume of waters undergo any variation, this variation, whether of excess or diminution, will be indicated by the mean level of the lake: thus the mean level of a lake will fall, if the annual quantity of running-water in the streams of the district diminish; while, on the contrary, it will rise if these streams become more copious, and will remain stationary if the volume of water which runs into the lake experiences no change.

In the district of Venezuela, in South America, there is a valley so completely surrounded by hills and mountains, that none of the streams and rivers which rise within it can find an outlet, and they therefore form a beautiful lake at its lowest level. This lake, called Tacarigua, was found by Humboldt to be about thirty miles in length by seven or eight in breadth, and elevated thirteen hundred feet above the level of the sea. He was told by the inhabitants of the valley that they had observed the waters of the lake to be gradually diminishing for thirty years. This circumstance induced M. Boussingault to make some investigations into the subject when he was in America. He found the Inca, a traveller, who spent much time in Venezuela in the last century, mentions the founding of the town of New Valencia in 1555, at a distance of half a mile from this lake; whereas Humboldt found it in 1800 to be more than three miles distant. That the water of the lake had really receded many proofs appeared on investigation. Certain rising grounds, in what was originally built on the margin of the lake, and possess the advantage of watering other parts, which without it would have been sterile and barren. At first sight it appears like a slight bridge thrown across the defile.

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THE EFFECTS OF FOREST-CLEARING ON LAKES AND STREAMS.

M. Boussingault, an eminent French naturalist and traveller, drew attention a few years ago to the remarkable effect which the clearing of a forest exerts on the lakes and running streams of a district. In the most cultivated and civilized countries of Europe, the clearing was effected so many ages back, that we have no means of comparing present with past appearances; but in America, where the march of man through the trackless forest is so rapid and so irresistible, the facts and appearances presented might be particularly valuable, if the "go-a-head" progress allowed time for their collection.

It is remarked by M. Boussingault, that an opinion prevails that in those regions where the process of clearing has been extensively carried on, less rain falls than formerly. In some cases the streams which were formerly copious, now no longer have water sensibly diminished; in other places rivers seem to have become more shallow, apparently by the disappearance of a portion of their waters, since the pebbly beds have come more and more into sight. Such observations have been principally made in valleys surrounded by mountains; and it has appeared to many that these changes have been on account of the cutting down of large masses of forest. In order to test this matter, M. Boussingault collected much information while residing and travelling in America, and the sum of his details seems to support the general opinion. He selected lakes as the assemblages of water most suited for his observations, since they may be considered as natural gauges calculated to assist in valuing the variations which may take place in the quantities of water fertilizing a given extent of country. If the volume of waters undergo any variation, this variation, whether of excess or diminution, will be indicated by the mean level of the lake: thus the mean level of a lake will fall, if the annual quantity of running-water in the streams of the district diminish; while, on the contrary, it will rise if these streams become more copious, and will remain stationary if the volume of water which runs into the lake experiences no change.
lake sixty or seventy years ago. The inhabitants have year by year observed the waters to diminish and the shores to extend. "If we inquire in the neighbourhood of Ubata," he remarks, "of any of the old men who in their younger days were devoted to the chase, or if we examine the records of any of the different parishes, no doubt will remain that numerous forests have since been thinned.

The clearing still goes on; and it is equally certain that the retreat of the water has not ceased, though it does not proceed so rapidly as it was wont to do." The neighbouring village of Fuguenawas built quite close to the lake of the same name not far from Ubata; but Boussingault found it three miles distant from the lake; and he also remarked that the neighbouring mountains, which had in former times been clothed with forests, were now almost stripped of trees: this he deemed evidence in support of the asserted connection between these two phenomena.

M. Desbassyns observes a singular circumstance in the island of Ascension, bearing upon this subject. In this island a beautiful spring is situated at the foot of a mountain originally wooded. The spring in the course of years was cut down, and the mountain cleared; and it was observed that the spring at the same time gradually diminished, and at length failed. The mountain was at a subsequent period again planted, and after a few years the spring reappeared, became gradually more and more productive, and finally was as copious as ever.

M. Boussingault states that he could not avoid associating these effects in something like the relation of cause and effect, when he visited two districts of South America, about alike in average temperature and in elevation, but very different as to vegetation. In leaving Panama and travelling towards the south into the provinces of San Buenaventura, Choco, and Esmeralda, he found the country covered with thick forests, furrowed by a multitude of rivers, and subjected to almost incessant rain. In another direction he passed into a district where there were no forests and hardly any vegetation, and here the whole district was so sterile, that sometimes years have been known to pass over without rain falling. It might indeed have been supposed that in America will not be at all, in one case and abundant rain in the other, was the regulating cause by which the amount of vegetation is determined; but the other instances adduced, in which a change in the vegetation has been followed by, instead of having followed, a change in the supply of rain and springs, show that there is something more involved in the matter.

Saussure's remarks on the Lake of Geneva and the surrounding mountains lead to the conclusion that the waters of that lake were several centuries ago higher than they are now; and this has in like manner been attributed to the gradual clearing of many of the neighbouring forests. On the other hand, many mountains, lakes, and streams, situated in districts not exposed to emigration, have not been subjected to the wretched character for ages.

M. Boussingault accounts for these changes in three ways. In the first place he expresses his opinion, founded on a wide range of observation, that extensive clearings lessen the amount of rain which falls in a given district; and he expresses a hope that the vast changes now going on in America will not be allowed to pass away without affording materials for placing this matter on a sure basis. In the second place, where the soil is laid more open to the atmosphere by the absence of tall trees, evaporation may go on more uninterrupted than in the contrary case. And, lastly, where a great extent of land is brought into cultivation for corn and other produce, the regular irrigation of the soil will make a larger diminution in the amount of water left unemployed in the streams and lakes. He adds, that the quantity of running-water does not appear to have varied in countries which have not been subjected to any changes arising from the progress of cultivation; and that, independent of their preservation of surface-water, forests husband and regulate their flow.

ON MERCHANTS' MARKS OR SYMBOLS.

Those who have attended to the subject of printing are aware that the early printers were in the habit of appropriating to themselves certain marks or symbols, as a means of determining the identity of their several productions. A similar custom formerly prevailed to a certain extent among other classes of manufacturers and merchants; but the particulars have until lately attracted only a small degree of attention. Mr. Charles Frost, in a paper read before the Hull Literary and Philosophical Society about three years ago, considered the subject in reference to these three questions:—Were merchants' marks used exclusively for commercial purposes? Or did they, under certain circumstances, become indicative of rank in the bearer? If the latter, were they used as substitutes for armorial bearings, or might they consistently be placed upon the same memorial with heraldic shields? The following is an abstract of Mr. Frost's details, with illustrations from other quarters.

In modern times the term 'merchants' marks' is familiar only to mercantile men, who have long been in the habit of adopting certain arbitrary characters or devices to designate the ownership of particular goods, their peculiar manufacture, or the various qualities of their workmanship. Some of these vocabularies and characters are so peculiar as to be utterly unintelligible beyond the sphere of their application. Others have become very ludicrous to the uninitiated. In all cases the reliance placed upon them is most implicit, and from the foreign and wholesale commerce of the greatest mercantile houses, down to the more humble retail-dealer, any violation of good faith in the employment of them cannot but be attended with pre-judicial consequences. Whenever such a violation is given, it is regarded as a gross intrusion of a private right and a fraud upon the public.

The law of England has thrown its protection over these symbols for commercial purposes, by extending its aid to prevent their piracy. An instance of judicial recognition of the right of individuals to assume exclusively peculiar marks occurred so early as the twenty-second year of Elizabeth's reign, in a case which was explained by Mr. Justice Doddridge thus:—"An action was brought upon the case in Common Pleas, by a clothier, that whereas he had gained reputation by the making of his cloth, by reason whereof he had great utterance, to his great benefit and profit, and that he used to set his mark to his cloth, whereby it should be known to be his cloth, and lighter clothiers, perceiving it, set the same mark to his ill-made cloth, on purpose to deceive him; and it was resolved that an action did well lie." In more recent instances courts of equity, as well as of law, have supported the principle of this decision. One or two instances of this may be interesting. In an article in a recent volume of the 'Law Magazine,' an account is given of a case which was supposed to involve whether a particular mark belonged to the manufacturer or to the manufactory wherein his goods were produced. The mark 'M C' had long been used to distinguish tin manufactured at particular works in Carmarthen. After a time the lessee of these works removed to other tin-works about forty miles distant, and continued to use the mark 'M C' at the latter
works during several years, while the Carmarthen works were unoccupied. Afterwards another person took the Carmarthen works, and commenced using the same mark on tin manufactured there; a course which the former lessee resisted, on the plea that the mark belonged to him. The ultimate decision of the Lord Chancellor, when this matter was submitted to him, was, that although the manufactory had been some time unoccupied, the mark belonged to it rather than the former lessee, and therefore the second lessee had a right to use it.

In another case, the proprietors of the London Con\ver"eance Company applied for an injunction against an omnibus proprietor, who began to run an omnibus on the same line of road, inscribed with similar words, such as 'Conveyance Company, &c.,' and having certain other symbols which were imitations of those on the Company's omnibus. The decision of the equity judge supported the principle that this imitation of mercantile symbols could not be permitted.

There are many circumstances which indicate that in the fourteenth, fifteenth, and sixteenth centuries a large measure of respect was paid to 'merchants' marks,' insomuch that they were considered of sufficient importance to be worthy of a place not only on the signs of houses, but in painted glass, upon tombstones, and on ornamental brasses. In an article in No. 61 of the 'Edinburgh Review,' it is stated that marks, 'in such a manner as to indicate his rank in society or his importance in the commercial world, why should not the printer's marks, which were equally frequent in Spain on the sign-boards and on the shop signs, be regarded as something more than mere exclusive, and which have given rise to much ingenious learning and speculation, as well as marks to the ancient Runic monograms, from which it is not unlikely that they were originally derived. The various commercial transactions.

Mr. Frost, after examining the monumental brasses exhibited in many of our churches, gives numerous examples to show that merchants' marks were not simply emblems for the possessor, but that they acquired character, and became entitled to attention and respect, in proportion as those by whom they were adopted accumulated wealth and obtained rank in society. And it is perhaps no matter for surprise to find the prosperous merchant desirous of transmitting to future ages, along with his name, the stamp of his character, and the device he had chosen to be associated with it in his various commercial transactions.

There are other buildings more appropriate than churches in which merchants' marks have been found as expressive of honour and respect to the individual to whom they belonged. Thus, in St. Mary's Hall at Coventry, which was erected in the early part of the reign of Henry VI. for the accommodation of the merchants, the hall is divided into courts, and a large room in which an angel is represented holding a shield, on which is depicted a mark or monogram, supposed to be a merchant's mark; and in the great hall of the same building is a painted window, on which is represented a man with a forked beard and a red cap and gown, and below him a shield bearing a merchant's mark and a scroll, designating him to be William Whychirch, who was mayor of Coventry in the year 1400. Other windows of the same hall contain similar indications of this practice.

The evidence collected on this point seems to lead to the conclusion that merchants' marks were in former times regarded as something more than mere commercial symbols, that they were regarded by the possessors as an honorary distinction analogous to the heraldic bearings of the noble.
PUBLIC IMPROVEMENTS, 1842.

In the metropolis the two great national edifices, the Houses of Parliament and the Royal Exchange, are making satisfactory progress. The immediate neighbourhood of the Royal Exchange has already assumed an improved architectural character. The Sun Assurance Office, on the site of St. Bartholomew's Church, Barbolomew-lane, is completed externally, and has attracted much notice from the uncommonness of its design, which is in the Italian style, but neither Palladian nor Roman, and is besides modified by many of the architect's own conceptions. Moxhay's building, in Threadneedle-street, also completed externally, is remarkable on account of the very extensive and classical piece of sculpture which adorns it. The statue of William IV. is nearly finished, and preparations will shortly be made for the site which it is intended to occupy, and which, as stated last year, will be the space opposite the Mansion House, where several streets meet. The progress of the Nelson column in Trafalgar-square has been slow. The new street along the line of Cateaton-street and Lad-lane is a decided improvement as regards public convenience, and would be still more so if it could be carried westward, so as to communicate immediately with St. Martin's-le-Grand; or if the south-end of Wood-street were made of the same width. The new street in continuation of Farringdon-street has been opened for foot-passengers, but no houses have yet been begun, and, as a thoroughfare, it will scarcely become of importance until it is carried farther into some principal street. At the London Bridge station of the Greenwich, Croydon, Brighton, and South Eastern Railways a building is in progress for the joint use of these companies, which, when completed, will be two hundred and fifty feet in length, facing the east end of St. Saviour's Church. It will be in the Italian Palazzo style; the centre comprising two stories, while a lofty gateway will occupy the centre of each wing. On one side of the station will be an observation-tower, rising to the height of about sixty-five feet, and commanding a view of the railway for several miles. In the course of a year or two we may expect the British Museum to show itself as one of the public buildings of the metropolis. The present old structure (the original Montague House) is to be taken down, and the Ionic portico and colonnades which are to form the façade of the new buildings towards Great Russel-street will be commenced, and when completed, the screen-wall between the front court and the above street will be removed. The restoration of Crosby Hall is now completed in the style of the latter end of the fifteenth century, the period when the 'Hall' itself was erected; but the parts restored are of a character more strictly domestic. The building is now occupied by the 'Crosby Literary and Scientific Institution.'

The alterations in the Temple Church have been completed. The interior has been not only restored, but completely renovated and decorated throughout, upon the most liberal scale, so as to form a very striking contrast to what it before was, and to be almost totally different from any other example of ecclesiastical architecture in this country, either ancient or modern. One interesting peculiarity in the plan of this church is the circular portion at the west end; and here not only the walls, mouldings, &c. have been thoroughly repaired, but the six clustered pillars supporting the arches have been taken down and replaced by new ones of the same material, viz. Purbeck marble. The ceiling of the centre part, or circular tambour above those arches, and which was before comparatively modern and of inferior character to the rest, has also been replaced by a handsome vaulted and groined one; and in the triforium are placed the mural monuments which used to encumber and disfigure the walls of the edifice. One of the clerestory windows in this part of the edifice has been filled with stained glass, therefore it is no doubt intended to glaze the others similarly, and when that shall have been done the general effect will be considerably heightened. The organ is now placed in a recess on the north side. Instead of pews, benches have been substituted in the side aisles, divided into separate seats, with carved elbows, and other ornamental work; and the floor has been laid with encaustic tiles, copied from ancient patterns. One of the most striking objects, on immediately entering, is the large triple window at the east end, which has
been entirely filled with stained glass, divided into compartments, representing as many subjects from the life of our Saviour, the spaces between which form a bordering or ground of mosaic pattern and brilliant colours. On either side of this window are three other openings with stained glass, with subjects allusive to the history of the Knights Templars; and on the south side, facing the organ recess, is another painted window, with figures of angels playing on musical instruments. Splendid, however, as these decorations are, they are not so striking in regard to novelty of character as the ornamental painting on the walls and roof—an application of polychromy, or rather a revival of such embellishment, which, owing to the long disuse of it, is now somewhat at variance with established notions of Gothic architecture.

In Wilton Church, near Salisbury, the style adopted (at the suggestion of the founder himself, the Hon. Sidney Herbert, M.P.) is as yet scarcely known at all in this country; yet, if so far exotic, it strongly recommends itself, as combining economy and simplicity with a more than ordinary degree of picturesque effect. The only other instance, as far as we are aware, of this style being adopted among us is Streatham Church, of which a description was given in our last volume (p. 499); yet, while the style is the same in each, the designs themselves are very dissimilar. At Wilton the campanile is placed almost at the west end, and is connected with the church by a vestibule or cloister, whose open arches and columns produce great richness of effect, and a pleasing contrast to the breadth and solidity of other parts. In consequence, too, of the tower being thus detached and brought forward, far greater play and variety than would else be the case are given to the whole composition, a different combination being presented from every point of view. As here shown, it is certainly very effective. The campanile, cloister, and body of the church produce a most picturesque architectural group, whose several parts admirably relieve each other. Independently of its design, the cloister is of great value in the composition, both on account of its producing greater variety in the general outline, and by giving greater comparative height to the body of the church than this last would have without that lower intermediate part between it and the campanile. On the same side of the church, at the east end, is a projecting porch, which materially increases the picturesqueness of the composition. A rather striking degree of character of unusual kind is also produced by the west front being elevated upon a platform or terrace, surrounded by a flight of steps. The centre entrance forms an open-recessed porch, into the staircases leading to the children's gallery at the west end of the church. Over this centre entrance is a series of small circular-headed arches, forming a
sort of exterior gallery at the back of the one within, and producing a good deal of relief and richness. Immediately above it is a very large rose-window of elaborate design, set within a square, whose spandrels are sculptured with the emblems of the four Evangelists. The arrangement of the interior is tasteful, and, simple as it is, provides for a good deal of effect, owing to the floor of the chancel end being on a rather higher level than that of the nave and aisles; to the columns within the chancel being different, and differently arranged from the others; and to there being apses, which recessed parts contribute also to variety externally, causing the east elevation to be of a different character from the others. There are neither pews nor galleries, except the small one at the west end, forming an upper recess within, over the porch: the interior is not built and blocked up, nor are the columns cut midway by the fronts of side galleries. The pillars of the nave are single shafts, partaking, both in their proportions and form of the capitals of the Corinthian character, as is common in Italian examples of this style; but, although in their shape and mass the capitals bear a resemblance to Corinthian ones, they are very differently composed, not only in respect to their foliage, but by having scriptural emblems combined with it. From these pillars spring semicircular arches (five on each side of the nave), and between them and the clerestory windows is a triforium, a feature that gives a very unusual degree of richness and variety to this part of the interior. Besides being distinguished from the nave by being on a different level, the chancel will be more elaborately decorated: here there will be a good deal of foreign marble and old glass; the floor will be paved in imitation of mosaic, and the groining of the roof and the semi-domes of the three apses will be painted in fresco. The pulpit and font will both be of marble.

The most remarkable feature in Christ Church, Westminster, now in progress, will be the tower and spire. Their united height will be two hundred feet,—only twenty-five less than the towers of Westminster Abbey. Neither is it height alone that gives effect to this part of the design, for it is otherwise of superior character, ably composed and boldly marked in outline, as may be judged from the annexed view. It will form a fine architectural object from St. James's Park, and for a considerable distance on each side in other directions. The style chosen by the architect is Gothic, of the later period of Early English. The exterior will be wholly of stone, and the arches, pillars, mouldings, &c. of the interior will be of the same material. The internal dimensions of the body of the church, or nave and aisles, are ninety-four feet by fifty feet six inches in width, exclusive of the apsis or chancel at the east end, which is separated from the rest by a richly moulded arch and clustered columns, and also distinguished by having an ascent of six steps up to it. Though there will be no pews, there will be
galleries, these being intended exclusively for the children of the National and Parochial Schools.

The French Protestant Church, St. Martin's-le-Grand, is a very tasteful specimen of Gothic. No more has been aimed at than has been satisfactorily accomplished, and without stint. At the same time it could be wished that this French church had been made in some degree a specimen of French Gothic, had it been little more than to the extent of introducing into the window at the east end or front towards the street tracery of flamboyant character. The minister's residence, which is attached to the south side, contributes not a little to the picturesqueness of the whole composition. The cost of the building is about 5000£.

Important for its size, and not for its size alone, the Wesleyan Theological Institution at Richmond is one that would not discredit either of our universities. The entire plan is two hundred and forty-eight feet by sixty-five, in its greatest depth, and that portion of the front which is between the wings is one hundred and sixty-five feet. As what may be called the chief or public rooms are on the ground-floor, that is treated as the principal one in the design: thus a different character (one by no means of an unpleasing kind) is produced from what is observable in collegiate structures generally, where the rooms so situated are low, and with smaller windows than those above them. Besides class-rooms, and some others, on this floor are the refectory and lecture-room, each fifty-seven by twenty-one feet, and the governor's apartments, all which are seventeen feet in height. Beyond the entrance-hall (forty-seven feet by twenty), which has a groined ceiling, is seen the principal staircase, branching off right and left. This leads to the library (thirty-five feet by twenty and two high), which is the only public room on that floor, all the rest of it being divided into studies or separate sitting-rooms for the pupils. The library is lighted by a single window at one end, namely, the lofty oriel over the entrance, which, contrasting with the other windows of the upper floors, gives a marked importance to that portion of the front; and it also plainly indicates that this apartment is carried up the height of two stories. The next floor consists entirely of sleeping-rooms for the students, corresponding with their sitting-rooms on that beneath it; and of each sort of rooms there are from sixty to seventy in number. Still higher up, however, there is another room quite at the top of the building, intended to be used as an observatory, and commanding a singularly fine prospect, including Windsor Castle in one direction, and Greenwich and Shooter's Hill in another. Upon the ground-floor there yet remains to be noticed the corridor, or ambulatory, extending nearly the entire length of the building, forming a walk two hundred and thirty feet in extent. The wings contain several additional rooms, on a mezzanine floor over the ground one. The exterior is of Bath stone, of superior quality; and the whole will be executed for a sum not exceeding 11,000£.

The Independent College, Manchester, has, like the preceding building, projecting wings, but of greater depth, so as to form the front into three sides of a quadrangle. The style belongs to the latest Gothic, and the front consists of two stories over an arcade or cloister, with an oriel over the entrance in the centre, above which rises a tower, surmounted by an octagonal lantern. The building is said to have cost 14,000£.

After the Fitzwilliam Museum, the Cambridge County Courts is one of the best pieces of modern architecture in Cambridge. The style is not only Italian, but Palladian, the composition being evidently a reminiscence of Palladio's loggie at the Basilica of Vicenza; but the differences are all in favour of the English rifacciamento. A pleasing degree of variety, without any prejudice to unity of composition, is thrown into the design by making the extreme compartments somewhat different from, while of apper with, the rest, thus limiting the open loggia to five arches; and, by being enclosed at its ends, that arcade is not only more sheltered, but produces a more forcible contrast of light and shade. The steps, too, being continued only along that portion of the façade, and then terminating at pedestals, considerably aids the general effect, and defines the leading divisions. The entire cost will not exceed 11,000£.
Gay, the author of the well-known 'Fables,' published, somewhat above a century ago, a lively work under the title of 'Trivia, or the Art of Walking the Streets of London,' in which he thus addresses the 'shoe-blacks,' an important fraternity at that time:

"Go, thrive: at some frequented corner stand;  
This brush I give thee, grasp it in thy hand;  
Temper the foot within this vase of oil,  
And let the little tripod aid thy toil;  
On this methinks I see the walking crew,  
At thy request, support the miry shoe;  
The foot grows black that was with dirt embrown'd,  
And in thy pocket jingling halfpence sound.

The Goddess plunges swift beneath the flood,  
And dashes all around her showers of mud:  
The youth straight chose his post; the labour ply'd  
Where branching streets from Charing Cross divide;  
His treble voice resounds along the Mews,  
And Whitehall echoes—'Clean your Honour's Shoes.'"

One of the early numbers of Mr. Knight's 'London,' wherein the above lines are cited, thus records a modern revolution in the black-ball world:—"In one of the many courts on the north side of Fleet Street, might be seen, somewhere about the year 1820, the last

* Gay gives to the shoe-black a mythological descent from the Goddess of Mud.
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of the shoe-blacks. One would think that he deemed himself dedicated to his profession by Nature, for he was a negro. At the earliest dawn he crept forth from his neighbouring lodging, and planted his tripod on the quiet pavement, where he patiently stood till noon was past. He was a short, large-headed son of Africa, subject, as it would appear, to considerable variations of spirits, alternating between depression and excitement, as the gains of the day presented to him the chance of having a few pence to recreate himself, beyond what he should carry home to his wife and children. For he had a wife and children, this last representative of a falling trade; and two or three little wolly-headed décrotteurs nestled around him when he was idle, or assisted in taking off the roughest of the dirt when he had more than one client. He watched, with a melancholy eye, the gradual improvement of the streets; for during some twenty or thirty years he had beheld all the world combining to ruin him. He saw the foot-pavements widening; the large flag-stones carefully laid down; the loose and broken piece, which discharged a slushy shower on the unwary foot, instantaneously removed: he saw the kennels diligently cleansed, and the drains widened: he saw experiment upon experiment made in the repair of the carriage-way, and the holes, which were to him as the 'old familiar faces' which he loved, filled up with a haste that appeared quite unnecessary, if not insulting.

We may picture to ourselves an old gentleman of the last century, with his foot upon a stool, reaping the lustrous fruits of the shoe-black's labours; and we may fancy we hear him cry—"Clean your Honour's Shoes!" But (to quote from the same work) "The blacking-makers are in more important positions now than they were; they surprise us with magnificent buildings—more like mansions than factories—and with highly organized agencies, and all the commercial machinery incident to factories—and with horses and waggons, travellers and agents, and all the commerical machinery incident to a large branch of manufacture. What sort of blacking the Londoners used a century ago, or who were the persons by whom it was made, we do not know; but if the streets are less miry now than they were then, and yet blacking be more generally used by all classes, we may make a sort of logical deduction, that we are more cleanly people than our ancestors—that the boots and shoes of 1842 are more resplendent than those of 1742. A city clerk or a London tradesman, instead of applying to the shoe-black at the corner of a court, and staying there until "the foot grows black that was with dirt embrowned," now has the mirror-like polish imparted to his boots before he leaves his house. He does not leave his door in search of an agent of cleanliness, for every house has now such an agent within. We are not about to instruct the reader how to make a bottle of blacking; but we hope to convey a slight idea of the large and remarkable extent of the arrangements involved in the manufacture, as carried on by a celebrated London firm. If any one were to picture to himself a dark and dirty room, containing a few tubs and coppers, and half a dozen men mixing up and bottling a black liquid—their faces and garments vying with the tubs and floor in blackness (and such a picture is not unlikely to be formed), he would be somewhat surprised at witnessing, as we have recently done, the scene presented at "Day and Martin's" factory in Holborn. Whether we regard this establishment in respect to its elegant exterior, the large and lofty packing-warehouse which forms its main apartment, the ranks and files and tiers of bottles in the filling-rooms, or the general economy which pervades the manufacture of a commodity apparently so humble as blacking, there is much to admire, and, perhaps we might say, much more from which the mind might be pleased; for the division of labour, and the appointment of duty, so that every man may be ready to do the work at the moment when the work is ready for him, and have just as much to do as will occupy his whole working-day, are features of factory-economy in which much ingenuity and calculation are called for. All the world has heard of "Day and Martin." The two names are so associated that we can hardly conceive a Day without a Martin, or a Martin without a Day; and that either Day, or Martin should ever die, or be succeeded by others, seems a kind of commercial impossibility—a thing not to be thought of. "Day and Martin" it has been for forty years, and "Day and Martin" it will probably be for forty years to come, or perhaps till the world itself shall be no more. To "London, chap. ii. "Clean your Honour's Shoes", p. 18.
This warehouse, from morning till night, is a continued scene of bustle and activity. It is the part of the premises in which the finished commodity is packed for London shopkeepers, for country trade, or for foreign shipment. Packers and porters and coopers occupy the greater part of the central area. The coopers are making or altering and adjusting the casks in which the bottles are generally packed; for many of the casks are made here from the rough staves, and all are fitted to the wants of the packers. The packers are in all sorts of attitudes, according to the state of the cask which is being filled: some are bending over the cask, to put in the lower layer of bottles; some, by having nearly filled a cask, are enabled to stand either more erect at their work; one man has got his foot in a cask, pressing down the straw; another, with a stick in his hand, is thrusting straw between the bottles; some are closing in the casks; and the porters are arranging the filled casks ready for removal from the factory. At night, both the filling-rooms and the warehouse are lighted with gas, by branches ranged along the centre.

On entering from Holborn, we come first to a range of offices and counting-houses, lying on the right hand side of the main archway or entrance. The polished mahogany desks and cases of these offices are the scene of the book-keeping operations of the custom-house kind, and do not call for notice here. At the north end of the wide entrance passage terminates in a large arched window, between twenty and thirty feet in height, a door in the lower part of which leads to the warehouse, the central portion of the whole establishment. This warehouse has a striking effect, both from its walls or roof may be reached from below, either for cleaning or repairing, or any more urgent purpose.

If the side of each filling-room were thrown open, the necessary apparatus for preparing the red-wax with water for heating the whole premises; and subterraneous communication is kept open from one side of the wide entrance passage terminates in a large arched window, between twenty and thirty feet in height, a door in the lower part of which leads to the warehouse, the central portion of the whole establishment. This warehouse has a striking effect, both from its walls or roof may be reached from below, either for cleaning or repairing, or any more urgent purpose.

Before ascending the two dozen steps which lead up to the galleries, we will follow out the lower range of the northern tier of rooms. An arched entrance leads on both sides between the walls and the roof. This central area is separated from the side aisles (if we may so term them) by arches and piers of brickwork, beyond which are these side warehouses, lighted only from the central skylights and windows.

The northern end of the warehouse presents, in the lower part, an arched entrance to another warehouse or storeroom beyond, and at the other end doors and windows belonging to the 'tun-room,' or manufactory in which the blacking is made. Two light and elegant iron staircases lead from the floor of the warehouse to the level of this upper room, one on each side. The side warehouses or aisles are not above half the height of the central portion; for they have over them two storeys, or galleries, called filling-rooms. Four openings furnish communication between these filling-rooms and the warehouse, two on each side; that is, one opening to each, in communication with the iron staircase, and one by which crates are hauled up to, or lowered from, the filling-room. If the side of each filling-room were thrown open, the whole would bear some resemblance to the form of a church: there would be a nave, or middle aisle, two side aisles, and two galleries over the latter.
coarser kinds for sealing bottles, need hardly be told that 'wax' is altogether a misnomer, for there is no wax in it. It is a compound of several resinous substances, coloured by some one among the numerous mineral colours. In the finer qualities, gum-lac is the principal resin, spirit of wine the principal solvent, and vermillion the chief colouring substance. Among manufacturers, however, common resin and spirits of turpentine and Venetian red, or some analogous blackening, are employed, although quite good for the materials of 'bottle-wax.' In this part of the factory bags and boxes and tubs of the ingredients are disposed conveniently for the manufacture, and a particular kind of furnace is provided for melting them. This furnace is deeply imbedded in brickwork, and situated in a recess quite secluded from any other part: it has also a heavy iron shutter which can be drawn down in front of it in an instant, and thus render the occurrence of an accident from fire scarcely possible. The melted ingredients, when thoroughly mixed, are poured into vessels to cool, thence to be removed and re-inculated in a way of which we shall speak hereafter.

Proceeding still farther northward, we come to a pair of folding-gates, which open into the last portion of this range. We here find the cart and wagon house, where the carts and wagons are kept which convey the manufactured article to the London dealers, the coach, wagon, canal, and railway offices, and the docks and shipping wharfs. On each side are stands for the horses, over which are corn and bay lofts. This brings us to the extremity of the range, to which an entrance is obtained by folding-gates from a small street beyond.

Let us now return to the great warehouse, and ascend one of the iron staircases to the upper range of buildings. Having surmounted this stair and reached a platform which crosses the northern end of the warehouse at a height of above twenty feet from the ground, we obtain a bird's-eye view of the operations below; and a busy scene it is. The cooperers and packers are distributed about the whole area below; crates of empty bottles are being hauled up, and other crates of filled bottles are being lowered. Opposite, at the southern end, a large clock meets the eye; and through the large arched window we catch a glimpse of bustling Holborn.

Let us proceed from this platform or passage into one of the galleries, or 'filling-rooms,' for there doors leading into the northern range of upper rooms, comprising those in which the manufacture is principally conducted. One of these, used as a store-room, opens upon the street behind, from which tubs, and butts, and casks of ingredients are hauled up and stowed round the room. The vinegar comes in casks of sixty gallons each, the oil in larger casks, the 'ivory-black,' or other kinds of black in casks containing nearly a ton each, and the remaining ingredients in packages and casks of various kinds, according to their quality.

From the store-room the ingredients are brought into the 'tum-room,' or manufactury, the least attractive but the most important place in the establishment. It is lighted by large windows, and ventilated by large doors. Near a hundred tubs, each capable of containing about a hundred gallons, are ranged from end to end of the room in regular rows. Each tub is supported on a separate stand, or trestle, half a yard in height; and each one is capable of being moved by a couple of men at a certain stage in the manufacture. The tubs are all more or less filled with blacking, according to the quantity of the day when they are seen. A few of them are filled with blacking of a stiffer or thicker consistence. The room also contains other vessels and apparatus connected with the manufacture.

On either side of this room are smaller rooms, in which subsidiary portions of the manufacture are carried on. In one are the vessels and arrangements for filling caps and tin cases with paste-blacking; and round this room are stored in immense number cylindrical packets, each containing a dozen tin-boxes, intended for the use of the army. A soldier is not provided with any too much room for his implements and appurtenances, and a bottle of liquid-blacking would be rather a burden to him. Yet, as the soldier's boots are made only to withstand the brightness and glitter of the boots of those who pay for battles instead of fighting them, a portable blacking apparatus is provided. The blacking, instead of being liquid, is made into stiff paste, and in that state is put into circular tin-boxes, about three inches in diameter, and half or three-quarters of an inch thick. What becomes of the tin-boxes when emptied—whether they are applied to any useful purpose, or whether, like the millions of pins made every year, they go no one knows whither—we cannot say.

From this room we proceed to the western gallery, or 'filling-room,' a room in which bottles certainly have the ascendant; for what with hauling up and opening crates, and disposing bottles, and corking, and sealing, and labelling, and packing, and sorting on shelves, it certainly is the busiest 'bottle-department' we have seen. The arrangement of this room is well adapted to facilitate the rapid progress of the manufacture. It is about ninety feet in length, and perhaps one-third as broad. Along the middle extends a double row of shelves or stands, three or four in height, each shelf being calculated to hold a score of bottles. Along the eastern and western walls are similar tiers of shelves or stands adapted for similar purposes. In the two avenues which separate these series of shelves are broad benches, fitted for holding the bottles during the processes of filling, corking, sealing, pasting, &c. At about the middle of its length is a door or opening in the east side, which placates the filling-room in communication with the warehouse below. A crane is fixed immediately outside this opening, by which crates of empty bottles are drawn up from the warehouse, and baskets of filled bottles lowered from the filling-room. The tiers of shelves in the room are fixtures; but the benches are provided with castors or wheels, by which they may be moved about to place in the position which they require. The room is lighted by ten or a dozen skylights in the daytime, and by gas at night, or rather in the evening. According to the time of the day when the filling-room is visited, will be the nature of the operations witnessed; but at all hours, from an early time in the morning till eight in the evening, men and boys are actively engaged in the operations which intervene between the making and the packing of the ingredient.

The western filling-room communicates with two of the manufacturing rooms and also with the iron platform stretching across the northern end of the warehouse. We will therefore pass along this platform and visit the eastern filling-room, which resembles the other in its main features. Nearly a hundred tubes, each capable of containing for bottles, disposed one above another, and in parallel ranges; but the eastern half of the room is somewhat differently occupied. Here the shelves, instead of being occupied by bottles, contain trays filled with blacking of a different kind, placed there to cool and solidify. The benches, too, and the operations of the workmen, are adapted to the manufacture of paste-blacking rather than that of a liquid kind. All the shelves in the two filling-houses are capable of containing six or seven thousand dozens of bottles; and as these bottles seldom remain many days on the shelves before they are packed, an incessant inter-
The bottle employed, as most persons are probably aware, is made of brown glazed earthenware: they are stored in bags or sacks containing a hundred gross each. These bags are packed with straw in large crates, each crate containing an average about a hundred dozen bottles, and weighing half a ton. The crates are first deposited on the floor of the warehouse, and are then hoisted up to the ‘filling-rooms’ by means of the large cranes seen in our frontispiece. When a crate is deposited in the filling-room, it is at once opened, and the bottles passed on with great quickness from hand to hand, and laid in regular rows on the broad benches near the centre of the room.

When the bottles are all thus arranged, and the blacking is in a prepared state, the latter is brought out of the tun-room or manufactory by several men, each tub or vessel being brought on the stand or frame by which it is supported. These vessels, to a considerable number, are then placed at equal distances near the bench which contains the empty bottles; and the process of filling then begins. Each vessel is attended by a man and a boy, the latter of whom continually stirs the blacking till the whole of it is bottled. The man stands by the side of the vessel with his left hand next to the bench of empty bottles; and in his right hand he holds a measure, or small can. Taking up a bottle in his left hand, he fills it with blacking by means of his
The bottles are filled, and the corks are adjusted in their places; but sufficient has not yet been done to secure the blacking in its prison-house. When a cork is so large as those here employed, the escape of the liquid contained in the bottle can scarcely be avoided unless some cement covers the whole surface of the cork and mouth of the bottle. A coarse kind of sealing-wax, as we have before observed, is used for this purpose, and is of course applied in a melted state. In some of the upper rooms of the factory are several portable stoves for melting the wax. These consist of tripods, supporting a brasier or pan for containing ignited charcoal; and immediately above the brasier is a kind of bowl or ladle for containing the sealing-wax. This substance, after being prepared, as was before alluded to, in the lower part of the factory, is taken up in lumps, and melted in these bowls or ladles. When melted, it has a cream-like consistence, and presents the well-known red colour. This apparatus being ready, and placed close beside the ranges of filled bottles, a workman proceeds to seal the corks. He has no brush, no ladle, no contrivance for pouring the wax on the cork, but, holding the bottle upside down, he just immerses the corked surface in the liquid wax. Practice has enabled the men to effect the dipping so exactly, that the wax rarely comes over the sides of the bottle. The apparently simple matter of reversing the bottle again, without scattering the wax, or causing it to flow over the sides of the bottle, is effected by a peculiar movement of the wrist and hand, impossible to describe, and difficult to imitate. Many of our manufactures present analogous instances, in which a process is effected quite as much by the muscular movement of the hand as a whole, as by the delicate agency of the fingers. For instance, 'imitation' or 'mock pearls' are made by blowing glass beads, so that each bead shall be hollow and shall have two holes in the exterior; then a liquid, made of a pearl-like powder obtained from the scales of fish, is dexterously blown into the hollow of the bead through a tube; and by a peculiar twisting of the hand, this single drop of liquid is made to diffuse itself over the internal surface of the bead, without having more or less than just enough to cover the whole. Again, in type-founding, when the melted type-metal has been forced into the mould, the caster throws up his left hand with a peculiar motion, giving it a kind of jerk at the same time with his right, by which the liquid metal is forced or shaken into all the minute interstices of the mould. Instances of this kind might be adduced in great number; and among them is this one of sealing the filled bottles. The celerity, too, with which this is effected is not less note-worthy than the neatness; for a man can seal one hundred dozens of bottles in an hour, or twenty in a minute.

The sealing, as well as the filling and corking, is effected in the two 'filling-rooms'; and so is likewise the next process, which is perhaps the most remarkable to a stranger of all which the factory presents, from the astonishing rapidity with which it is effected,—we allude to the pasting of the labels on the bottles. But before speaking of this process, it will be desirable to pay a little attention to the labels themselves, the intricacy of which has doubtless puzzled many persons.

Those who have not watched the proceedings of the last few years in respect of colour-printing, can perhaps scarcely conceive how the printing of these blacking labels can be effected. If we examine one of "Day and Martin's" labels, we see that nearly the whole of the ground contained in the bottle; a fourth, the number of the house, curiously bedecked with a double enunciation of the name of the firm; a third, the retail price of the commodity contained in the bottle; and two others containing remarks and directions to the purchaser. All these are printed with black ink on the white paper, no red lace-work being here seen. Above these are letters printed in black and white on a wavy or undulating ground of black, red, and white; while at the top are red letters, and at the bottom are black, printed on, or at least interspersed among, the lace-work ground itself. All this relates to the labels for the liquid blacking contained in bottles; and the circular labels for paste blacking are on the same principle, through different in detail.

Now it may naturally be asked by those to whom the subject is new, how these various devices, and these differently coloured inks, can be imprinted on one piece of paper without confusion or distortion. Without going into any description of the various modes by which printing in diverse colours is now effected, we will attempt a brief sketch of the contrivance by which these labels are produced. One of the rooms in the factory is a printing-room, in which is contained a cylinder printing-machine, specially adapted for printing many-coloured devices, such as those on these labels. There is one cylinder for printing all the red portion, and another for printing the black. Eight plates are printed at once, but it will simplify the description if we speak only of one. In the first place a stereotype plate is arranged for receiving the device of the black portion of the label; and another, exactly the same size, for the red portion. These plates, for
the liquid blacking, measure rather less than five inches by four; and on the surface is depicted, in red, all the several blocks for printing floor-cloths, which are afterwards inked and printed; the plates being prepared, we believe, by a combined process of casting, stamping, and modelling. The plates are so exactly adjusted, that every raised part in one of them shall coincide with a depressed part in the other, and vice versa. This is in fact precisely the same principle as that on which the several blocks for printing floor-cloths are adjusted, as described in one of our recent Supplements. The nature of the adjustment might be instructively shown by printing a label by hand with the two plates; although, of course, this would never do in practice. We might take one of the plates, carefully ink its surface either by an inking-ball or an inking-roller, and then impress it on a piece of damp paper. Then (supposing the first inking to have been black) if we ink the second plate with red, and print the paper a second time, the clearness or confusion of the resulting device would correctly measure the degree of accuracy with which the one impression was superposed on the other. Due to the other having a depression corresponding exactly to the raised part in its companion, the eye can scarcely follow. To a spectator it seems that almost before the bottle is taken fairly into the hand, it is laid down again, properly labelled. Let any uninitiated person endeavour thus to secure sixteen labels per minute to as many bottles, and see what progress he will make.

If the printing-machine were adapted for flat printing, these prepared plates might be adjusted to a flat bed or support. But a cylinder-machine is employed, in which both the plates lie on the surface of cylinders. Here, however, a difficulty at once occurs. If flat plates be placed on a curved surface, it is easy to see that they cannot conform to the curvature of that surface; and the mode of contact between the plates and a sheet of paper to be printed would be wholly incompatible with the object in view. The means had therefore to be devised of curving the plates without disturbing the device on their surfaces; and this has been effected. Eight plates, all exactly alike, are bent in conformity with the curvature of the cylinders, and are then fixed to the surface of one of the cylinders by means of delicate adjusting mechanism. Eight other plates, all alike, but differing from the former, are similarly fitted to the surface of the other cylinder. These two cylinders are so adjusted in the machine as to rotate in contact, or nearly in contact, with a third, round which a sheet of paper may be made to travel. An inking apparatus for black ink is placed near one cylinder at one end of the machine; another apparatus for red ink is fixed near the other cylinder at the other end; and when the machine is at work, if a sheet of damp paper be placed at one end, it is drawn into the machine, carried over and under various rollers, and made to pass under the two cylinders. Meanwhile, by various rollers and other connecting mechanism, the eight plates on the one cylinder become coated or charged on the projecting parts with black ink, and those on the other with red; and manners are so adjusted, that exactly when the paper comes near the black-inked cylinder, the plates are ready to print; and immediately after the paper has received its black impress, it is caught by the other cylinder and printed with the red portion of the device. As may be readily supposed, the most scrupulous exactness of adjustment is necessary, in order to ensure the juxtaposition of the red and black portion of the device at the proper places. By means of adjusting-screws, the printing-plates can be shifted to so minute a distance as the two-hundredth of an inch, in order to bring the "register," or superposition of device, at the proper points. One grain of ink only is used to print eight labels. The circular labels for the paste-blacking tin boxes, as the square ones for the bottles, are printed at this press. The demand is so large and so constant, that the machine is nearly always at work; and when the sheets of labels are printed, boys are employed to cut the separate labels from them.

These are the labels, then, which we are now to see pasted on the bottles. One man or boy can paste as many labels as two others can attach to the bottles, so that they work together in groups of three. On the bench is placed on the one side a large tub of paste, and on the other a ranged series of filled and sealed bottles. A heap of labels is laid down face downwards, and the pasters paste them one by one with a brush. The dexterity in this simple act is not in the pasting, but in a peculiar final touch with the brush, by which the pasted label is jerked off the heap, and caught in the left hand. So rapidly is this effected, that one man can thus paste a hundred and sixty dozen labels in this time. As fast as the labels are pasted, the other two workmen attach them to the bottles. Each one takes a bottle in his left hand, and a pasted label in his right, and attaches the one to the other by two or three touches, the attachment being so exact that two or three hands cannot catch it in; which the eye can scarcely follow. To a spectator it seems that almost before the bottle is taken fairly into the hand, it is laid down again, properly labelled. Let any uninitiated person endeavour thus to secure sixteen labels per minute to as many bottles, and see what progress he will make.

The labelling of the bottles is the last process which is effected in the filling-room. All the bottles, after having been labelled, are ranged on the systems of shelves in the filling-rooms, and there kept till the paste is properly hardened. They are then put into a basket, and lowered from the filling-room to the warehouse by the aid of one of the cranes. Here they pass into the hands of the packers and cooperers. The general mode of sending out the bottles from the factory is in casks, containing from three to a hundred dozens. The casks are prepared by the cooperers to the proper dimensions, and the packers proceed with their work. This, like many other apparently simple operations, requires tact and judgment. The packer first ranges a circle of bottles round the inner surface of the cask, then encircles a wisp of straw within this ring of bottles, and then arranges a smaller ring. In this way he proceeds till one tier is filled; and by the aid of a stick or wedge he inserts straw and extra bottles wherever there is room for the one or the other, until at length the whole are jammed immoveably together. A second tier of bottles is then built up, separated from the lower one by a layer of straw; and this is in
as a similar manner hardened and compressed till nothing can shake about or become displaced. So on to the top of the cask, which is finally topped with straw, and the head fastened in, ready for marking and carting.

Such is the career of a bottle of blacking, before it leaves the hands of the manufacturer. But there are one or two other forms of blacking which we may briefly notice, in illustration of the arrangements of this factory.

We have before said that in one of the rooms of the factory small tin boxes are piled in great number, and that these contain, or are destined to contain, paste-blacking for the use of the army. Whether any particular ingredients are used in this composition, different from or in addition to those which compose liquid blacking, we do not know; but the consistency to which it is mixed is much stiffer. The paste-blacking, when fully prepared, is contained in a large vessel or tub, round which two or more boys place themselves, each one provided with a small scoop or ladle, shaped like a spoon, with the handle affixed to one side instead of one end. Tin boxes are close at hand, which the boys take one by one, and fill with the thick paste-like blacking. All the boxes, as they are filled, are ranged in rows in the filling-room, where they remain till the blacking has solidified, and assumed a stiff clayey consistency. Then, tin covers are put on them, and they are packed in dozens, and wrapped in paper. They reach the soldiers, we believe, through the medium of the army clothiers.

There is another kind of paste-blacking which is sold in little wide-mouthed stone pots, something like crucibles. This is nearly the same in quality as the soldiers' blacking; while the pots are of the same character, as to material, as the bottles. The paste-blacking is laded into them by the same simple apparatus as into the tin boxes, and is then allowed to stand aside to solidity; after which the mouths of the pots are well secured with paper.

Another form of blacking, different from all the others, remains yet to be noticed. This is a kind which is stiffer than liquid or bottle blacking, but thinner than the other kinds: it is in fact a soft paste. Its mode of being packed into a saleable form, after the manufacture is finished, is very different from the other instances. Shallow moulds or trays are provided, about half a yard long, two-thirds as wide, and half an inch or so in depth. Into these moulds the paste-blacking is poured or laded from a large vessel; and the moulds are then put by on shelves to cool and solidify. One side of the eastern filling-room contains a very large number of these moulds, standing by till their contained blacking has become cool. When this cooling is effected, each tray or mould is laid flat on a bench, and one of the edges or ledges is removed, so as to enable a knife to be passed under the solidified blacking, as a means of loosening it from the bed of the mould. The whole sheet of blacking, if we may so term it, is then cut up into six dozen rectangular pieces, twelve in length and six in width, by a convenient kind of knife; and the cakes are then in the shape in which they are sold. But they are too soft to be left without a covering; while, on the other hand, they require neither bottles, pots, nor tin boxes. Pieces of paper, first printed with the name of the manufacturer, &c., are well saturated with oil, and when dry, are fit to be used as wrappers to the small cakes of blacking. The papers are laid flat on a bench, one cake is put into each, and by one of those neat and expeditious manipulations which so many other parts of the factory exhibit, the cakes are wrapped up, each in its oiled paper. Then, in order to sell these cakes to the dealers in a form fit to be handled, small wooden boxes are provided, each capable of holding a certain number, packed neatly one upon another.

Thus have we rapidly sketched the chief manufacturing features of the place, so far as is necessary for the present object; and have to acknowledge the courtesy of the proprietors in furnishing the facilities for so doing. Every day, we have said, witnesses a pretty regular and uniform series of operations. The actual manufacture takes place at an early hour in the morning; while the bottling, corking, sealing, labelling, moulding, and wrapping cake-blacking, bottle-washing, &c., occupy the remaining hours of the day in the upper and hinder rooms. The packing in the warehouse is so arranged as to enable the waggons and carts to be dispatched with one cargo to the various dealers, wharfs, docks, &c., in different parts of town, at a pretty early hour in the morning; and with another cargo at a later period of the day. Taken altogether, it must be owned that a day at "Day and Martin's" is an early day, and a long day, and a busy day.

END OF VOLUME THE ELEVENTH.